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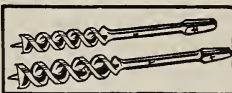


Gleanings in Bee Culture

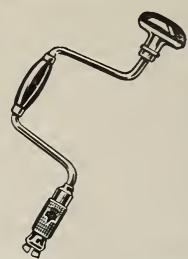
VOL. XLII. FEB. 1, 1914, NO. 3.



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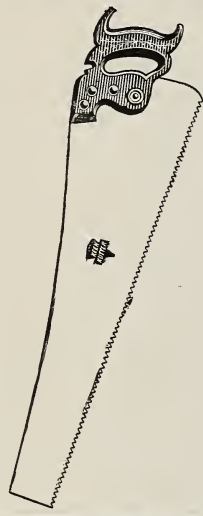
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the all-important tool of the most extensive honey producers of the world. This illustration shows the remarkable steel fire-grate which such men as Mr. France, Mr. Rauchfuss, the Dadants, and others say is the best on the market. . The Smoke Engine grate has 381 holes for air and draft—equal to an opening two inches square. Buy the large sizes and be pleased. For sale at your dealers or direct.

- Smoke Engine, 4-inch stove, wt. 1½ lbs., \$1.25
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A. G. WOODMAN CO.
GRAND RAPIDS, MICH.

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Take advantage of the early-order discount, send us your list of requirements, and we will quote you our very best factory prices and discounts.

Having recently constructed an eight-car-capacity kiln, and having enlarged our power plant, we shall be able to handle your orders to the best advantage.

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Send for our foundation samples and Red Catalog, postpaid.

W. T. Falconer Manufacturing Company, Falconer, New York
Where the good beehives come from

HONEY Bought Sold...

Central Ohio Honey Market

Finest quality WHITE-CLOVER honey a specialty. Producers who have not yet sold their crop should write. Those who have disposed of their crop and are in need of more for their trade, I shall be glad to supply at lowest prices consistent with highest quality and a fair margin of profit.

The correspondence of wholesale and retail dealers is especially solicited, as I am in position to furnish a grade of comb and extracted honey that will suit the most exacting trade. If interested, write for quotations and full description of the line.

Bee Supplies

Now is the best time to place your order for supplies for use next season. The prospect was never brighter, and there is every thing to gain and nothing to lose by ordering before the spring rush is on. Ask for revised price list and early-order discounts.

Root Quality and Peirce Service
from Ohio's Supply Center

E. W. Peirce, Zanesville, O.

Airdome Bldg., South Sixth St.

It turns over an important "new leaf" beginning with the January number.

The Guide to Nature

Several New Features

"Birds in the Bush," a department edited by Edmund J. Sawyer, with illustrations from original drawings by this talented artist-ornithologist.

"The Fun of Seeing Things," a department for young folks, edited by Edward F. Bigelow, succeeding his well-known work as editor of the "Nature and Science" department of "St. Nicholas" for more than fourteen years.

This new department will be really new. It will not be "schooly," not "nature study," not to induce parents and educators to say, "It is good for the children," but it will appeal directly to the young folks themselves and will help them to enjoy the natural objects that surround them. It will be true to its name.

Subscription \$1.00 a year; single copy 10c. To new subscribers (during February only), six months' trial for only 25c. Address (and make check or money order payable to)

The Agassiz Association,
ARCADIA :
Sound Beach, Connecticut



EARLY-ORDER DISCOUNTS WILL

Pay You to Buy Bee Supplies Now

29 years' experience in making everything for the beekeeper. A large factory specially equipped for the purpose ensures goods of highest quality. . . . Write for our illustrated catalog and discounts today.

LEAHY MFG. CO., . 95 Sixth St., . Higginsville, Missouri

HONEY MARKETS

The prices listed below are intended to represent, as nearly as possible, the average market prices at which honey and beeswax are selling at the time of the report in the city mentioned. Unless otherwise stated, this is the price at which sales are being made by commission merchants or by producers direct to the retail merchants. When sales are made by commission merchants the usual commission (from five to ten per cent), cartage, and freight will be deducted; and in addition there is often a charge for storage by the commission merchant. When sales are made by the producer direct to the retailer, commission and storage and other charges are eliminated. Sales made to wholesale houses are usually about ten per cent less than those to retail merchants.

NATIONAL BEEKEEPERS' ASSOCIATION GRADING-RULES Adopted at Cincinnati, Feb. 13, 1913.

Sections of comb honey are to be graded: First, as to finish; second, as to color of honey; and third, as to weight. The sections of honey in any given case are to be so nearly alike in these three respects that any section shall be representative of the contents of the case.

I. FINISH:

1. *Extra Fancy*.—Sections to be evenly filled, comb firmly attached to the four sides, the sections to be free from propolis or other pronounced stain, combs and cappings white, and not more than six unsealed cells on either side.

2. *Fancy*.—Sections to be evenly filled, comb firmly attached to the four sides, the sections free from propolis or other pronounced stain, comb and cappings white, and not more than six unsealed cells on either side exclusive of the outside row.

3. *No. 1*.—Sections to be evenly filled, comb firmly attached to the four sides, the sections free from propolis or other pronounced stain, comb and cappings white to slightly off color, and not more than 40 unsealed cells, exclusive of the outside row.

4. *No. 2*.—Comb not projecting beyond the box, attached to the sides not less than two-thirds of the way around, and not more than 60 unsealed cells exclusive of the row adjacent to the box.

II. COLOR:

On the basis of color of the honey, comb honey is to be classified as: first, white; second, light amber; third, amber; and fourth, dark.

III. WEIGHT:

1. *Heavy*.—No section designated as heavy to weigh less than fourteen ounces.

2. *Medium*.—No section designated as medium to weigh less than twelve ounces.

3. *Light*.—No section designated as light to weigh less than ten ounces.

In describing honey, three words or symbols are to be used, the first being descriptive of the finish, the second of color, and the third of weight. As for example: *Fancy, white, heavy (F-W-H)*; *No. 1, amber, medium (1-A-M)*, etc. In this way any of the possible combinations of finish, color, and weight can be briefly described.

CULL HONEY:

Cull honey shall consist of the following: Honey packed in soiled second-hand cases or that in badly stained or propolized sections; sections containing pollen, honey-dew honey, honey showing signs of granulation, poorly ripened, sour or "weeping" honey; sections with comb projecting beyond the box or well attached to the box less than two-thirds the distance around its inner surface; sections with more than 60 unsealed cells, exclusive of the row adjacent to the box; leaking, injured, or patched-up sections; sections weighing less than ten ounces.

NEW HONEY-GRADING RULES ADOPTED BY THE COLORADO STATE BEEKEEPERS' ASSOCIATION, DECEMBER 13, 1911.

FANCY WHITE.—Sections to be well filled, comb firmly attached to all sides and evenly capped except the outside row next to the wood. Honey, combs, and cappings white, and not projecting beyond the wood; wood to be well cleaned; no sections in this grade to weigh less than 13½ ounces.

No. 1.—Sections to be well filled, combs firmly attached on all sides and evenly capped, except the outside row next to the wood. Honey white or very slightly off color. Combs not projecting beyond the wood; wood to be well cleaned; no section in this grade to weigh less than 13½ ounces.

CHOICE.—Sections to be well filled; combs firmly attached; not projecting beyond the wood, and entirely capped, except the outside row next to the wood. Honey, comb, and cappings from white to amber, but not dark; wood to be well cleaned; no section in this grade to weigh less than 12 ounces.

No. 2.—This grade is composed of sections that are entirely capped, except row next to wood, weighing from ten to twelve ounces or more, also of such sections that weigh 12 ounces or more, and have not more than 50 uncapped cells all together, which must be filled. Combs and cappings from white to amber in color, but not dark; wood to be well cleaned.

EXTRACTED HONEY.—Must be thoroughly ripened, weigh 12 pounds per gallon. It must be well strained, and packed in new cans. It is classed as white, light amber, and amber.

STRAINED HONEY.—This is honey obtained from combs by all other means except the centrifugal extractors, and is classed as white, light amber, amber, and dark; it must be thoroughly ripened and well strained. It may be put up in cans that previously have contained honey.

BOSTON.—We quote fancy and No. 1 white comb honey at 15 to 16; fancy white extracted honey in 60-lb. cans, 11. Beeswax, 30.

Boston, Jan. 16.

BLAKE-LEE CO.

ZANESVILLE.—I quote fancy white comb, jobbing, 17 to 18; wholesale, 19 to 20; No. 1 white, jobbing, 16 to 17; wholesale, 18 to 19; extracted, 60-lb. cans, white, jobbing, 9 to 9½; wholesale, 9½ to 10½; 60-lb. cans, light amber, jobbing, 6½ to 7½; wholesale, 8 to 8½. For beeswax, producers receive 30 to 32; selling price per 100 lbs., 40 cts. Prices remain firm, though the market is very quiet.

Zanesville, O., Jan. 16.

E. W. PEIRCE.

Honey reports continued on page 5.

**JUST
OUT!**

New 1914 Catalog--"Everything for Bees"

Lay your plans for the new season now. Send for the 1914 Muth Catalog of Beekeepers' Supplies. It's just off the press. In it you will find full information about the remarkable MUTH SPECIAL Dovetailed Hives. Drop a postal card at once—sure!

THE FRED W. MUTH CO.

204 WALNUT STREET

"The Busy Bee Men"

CINCINNATI, OHIO

P. S.—Ship us your old combs and cappings and let us render them for you. Our process extracts the last drop of wax from the slumgum. This means money for you. Write for full particulars.

SPECIAL DELIVERY

During this month we shall double our usual efforts in points of delivery and service. We carry nothing but the Root make, which insures the best quality of every thing. We sell at factory prices, thereby insuring a uniform rate to every one. The saving on transportation charges from Cincinnati to points south of us will mean quite an item to beekeepers in this territory. We are so located that we can make immediate shipment of any order the day it is received.

New 64-page Catalog

Our new 1914 catalog contains double the pages of former editions and requires extra postage. It is filled from cover to cover with complete lists of goods in every line to meet every requirement of beekeepers. If you haven't received a copy when you read this, be sure to ask for one. It will save you money.

New Features for 1914

Few radical changes have been made this season. It should be noted, however, that we will send out with regular hives, unless otherwise ordered, the metal telescopic or R cover with super cover underneath. The side rail for the bottom-board will be extra length so as to overcome the difficulty experienced by some last season. Improvements have been made in extractors. We shall carry a very heavy stock so that orders may be filled with our usual promptness. Write us your needs. Early-order discount this month 2 per cent.

C. H. W. Weber & Co.

2146 Central Avenue

Cincinnati, Ohio

Gleanings in Bee Culture

E. R. ROOT

Editor

A. I. ROOT

Editor Home Dept.

H. H. ROOT

Ass't Editor

J. T. CALVERT

Business Mgr.

Department Editors:—Dr. C. C. Miller, J. E. Crane, Louis H. Scholl, G. M. Doolittle, Wesley Foster, J. L. Byer, P. C. Chadwick.

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HOW TO REMIT. Remittances should be made by draft on New York, express-order or money-order, payable to the order of The A. I. Root Co., Medina, Ohio. Currency should be sent by registered letter.

AGENTS. Representatives are wanted in every city and town in the country. A liberal commission will be paid to such as engage with us. References required.

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IDAHO FALLS.—We quote finest white extracted honey in square 60-lb. tins at 6½ to 7.

IDAHO HONEY-PRODUCERS' ASSOCIATION.
Idaho Falls, Jan. 19. F. C. BOWMAN, Sec.

BUFFALO.—The supply of honey is liberal. Demand for white comb is very slow; demand for both extracted and comb (buckwheat) very good. Fancy white comb honey, 16 to 17; No. 1 ditto, 15½ to 16; No. 2 ditto, 12 to 13; No. 1 buckwheat, 13 to 14; extracted white, 8½ to 9; dark, 6 to 7; beeswax, 23 to 30.

Buffalo, N. Y., Jan. 17. W. C. TOWNSEND.

DENVER.—Our local market is well supplied with honey, and our jobbing quotations are as follows: Strictly No. 1 white, per case of 24 sections, \$2.70; choice, \$2.57; No. 2, \$2.43; extracted white, 8 to 9 cts.; light amber, 7 to 7½. We are in the market for beeswax, and pay 30 cts. per lb. in cash, and 32 in trade, delivered here.

THE COLORADO HONEY-PRODUCERS' ASSOCIATION,
Denver, Col., Jan. 20. FRANK RAUCHFUSS, Mgr.

KANSAS CITY.—The demand for both comb and extracted honey is very light, especially for comb. Receipts of extracted are light, but receipts of comb honey are large. We quote No. 1 white comb, 24 sections per case, \$2.60 to \$2.75; No. 2 ditto, \$2.40 to \$2.50; No. 1 amber ditto, \$2.75; No. 2 ditto, \$2.25 to \$2.50; extracted white, per lb., 8 to 8½; extracted amber, 7 to 8. Beeswax, per lb., 25 to 30.

C. C. CLEMONS PRODUCE CO.

Kansas City, Mo., Jan. 14.

ST. LOUIS.—Our local market is well supplied with honey, and trade has been somewhat quiet on account of mild winter. We are quoting to-day fancy white honey, 15 to 16; light amber, 14 to 15; amber, 12 to 13, and dark amber, 9 to 11. By the case, 24 combs to the case, fancy white brings \$3.25 to \$3.50; light amber, \$3.00 to \$3.25; amber, \$2.50 to \$2.75; dark and broken combs, less. Beeswax, 32½ for prime. Inferior and impure sells for less.

R. HARTMANN PRODUCE CO.

St. Louis, Mo., Jan. 19.

CHICAGO.—Sales have been very slow and unsatisfactory for the past thirty days, and there does not seem to be any encouragement in the present outlook. Stocks are heavy and prices are uncertain; for that reason it is difficult to give accurate figures. A No. 1 to fancy grades of comb are held around 15 cts. per lb.; but alfalfa mixed and sweet-clover grades are difficult to move at much lower prices. Fancy grades of white clover and basswood extracted honey sell at 8 to 9, according to quantity and other considerations; amber 7 to 8. Beeswax is steady at from 31 to 33, selling upon arrival.

Chicago, Jan. 17. R. A. BURNETT & CO.

NEW YORK.—Our market is decidedly dull, and the demand during the past six weeks has fallen off to a great extent—even more than in former years, notwithstanding the short crop of some grades. While comb honey is pretty well cleaned up, small shipments are yet coming in quite freely; and while fancy and No. 1 white are in fair demand, off grades, dark and mixed, are almost entirely neglected. We quote No. 1 and fancy white at 14 to 15; No. 2 white and light amber at 12 to 13; dark and mixed, 10 to 11. Prices on extracted remain about the same, with very little trade at this time. Beeswax is steady at from 32 to 33.

New York, Jan. 19. HILDRETH & SEGELKEN.

CINCINNATI.—There is no demand for comb or extracted honey—a condition that is a general rule for this season of the year. However, this season it has assumed a peculiar condition owing to apparent big stocks of honey on hand, and the holders see fit to slash prices. Whether it will have any tendency to lower the values further than they now are, remains to be seen within the next 90 days, and for that reason we will not quote prices this month. Beeswax is in very good demand, and we are paying 32 cts. cash and 34 in trade for good average wax, and from 1 to 3 cents per lb. more for something in choice bright yellow, delivered here.

THE FRED W. MUTH CO.

Cincinnati, Ohio, Jan. 19.

Deposit your Savings with The SAVINGS DEPOSIT BANK CO.

of MEDINA, O.

The Bank that pays 4%

Write for Information

A.T. SPITZER
PRESIDENT

E.R. ROOT
VICE-PRESIDENT

E.B. SPITZER
CASHIER

ASSETS OVER ONE MILLION DOLLARS

Are Your Bees Short of Stores?

We have candy in large paper pie-plates just right for late winter and early spring feeding. Write for prices. We carry a full line of supplies at all times.

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182 Friend Street

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A Carload of Brand-new Goods

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BEES, QUEENS, HONEY, WAX

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185 Wright Avenue

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This is the season for discounts on

Bees and Bee Supplies

If you will send us a list of goods needed we will be pleased to quote you on them. Catalog free.

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Apiaries, Glen Cove, L. I.

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Send your name for new 1914 catalog out in January. Dept. T, C. C. CLEMONS BEE SUPPLY CO., Kansas City, Mo.

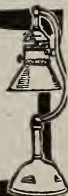
Alsike - Clover - Seed

Small Red, Large Red, White, Yellow Sweet Clover; Alfalfa, Timothy, Blue Grass, Millet, Rape, etc. Good Seed Corn in varieties. Seed leaflet and apiary-supply catalog free.

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Carroll County

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"BEST"
Light

The problems of adequate illumination vanish when you install a "Best" Light system. More than 200 styles are pictured in our catalog—every one of them guaranteed to give a clear, radiant white light at lower cost than any other illumination you can use. Agents wanted.
THE BEST LIGHT CO.
306 East 5th St., Canton, O.



Gleanings in Bee Culture

DEVOTED TO HONEY, BEES, AND HOME INTERESTS.

A. L. BOYDEN, Advertising Manager.

Established 1873.

CIRCULATION 35,000.

Issued semi-monthly.

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Preferred position, inside pages, 30 per cent additional.

Preferred position, inside cover, 50 per cent additional.

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No medical or objectionable advertising accepted.

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Column length, 8 inches.

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On the Gulf Coast of Southern Florida

All the early vegetables, marketed at highest prices, are successfully grown—3 and 4 different crops per annum. A home in a delightful year-'round climate. A young man paid \$125 for an acre of land this year, and spent another \$125 in clearing and cultivating it in tomatoes. The production was 550 baskets, which were sold at \$2.50 per basket; total gross production from a single crop on an acre of ground, \$1375. The same advantages and opportunities are open to you. Let us tell you in detail of the possibilities in this favored section. Ask for beautiful illustrated book, "Fruit and Vegetable Growing in Manatee County."

J. A. PRIDE

General Industrial Agent
SEABOARD AIR LINE RAILWAY
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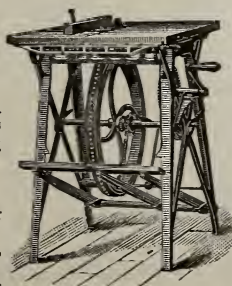
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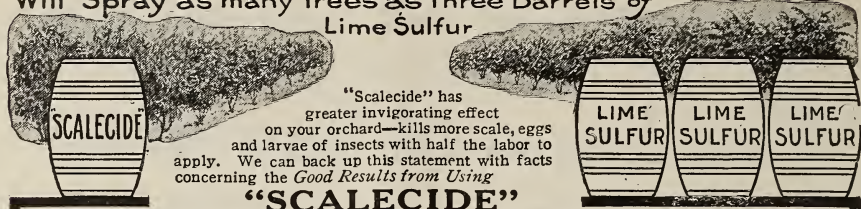
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The A. I. Root Co., Medina, Ohio

New Goods Arriving!

We are getting our stock for next season, and should be glad to have your order for any supplies you are to use next year. A folder, with new prices, will be mailed you on request. . . .

The A. I. Root Co., Syracuse, N. Y.

"If goods are wanted quick, send to Pouder."

ESTABLISHED 1889

Bee Supplies

Bees in this zone are in winter quarters with a bounteous supply of natural winter stores, and I believe that no other feature is quite so important as regards safe wintering as an abundance of wholesome stores. The fall flow was so profuse that in some instances brood-rearing was curtailed early on account of crowded condition, and some strong colonies were weakened on this account. A few losses may result from this condition. The white clover in this zone is in good condition with the exception of a few counties which suffered from drouth. Conditions for ensuing year are very encouraging for both beekeeper and the supply-dealer. The last year will be remembered as a most excellent honey year, and with it came the best demand for honey that has ever been known. I am receiving more inquiries and orders for Root Bee Supplies than ever before during midwinter, and some discounts for early orders are still available. The policy of this house as to prompt shipments and a fair and satisfactory deal will be maintained as heretofore, and I hope to deal with you in a way that will justify your recommending my goods to your neighbor.

WALTER S. POWDER:—*I am more than pleased with your promptness. Kentuckians are generally credited as being quick with a gun, but I do not think the fastest in that line can equal the speed a certain Indiana man uses in shooting out the goods. Those paper honey-jars are certainly the trick for local trade.*

Louisville, Ky.

Yours truly,

OTTO F. RECKTENWALD.

I should like to place in your hands my catalog with 1914 revised prices on bee supplies. Or send a list of your requirements, and let me see if I can not create a saving for you by quoting an estimate. This will place you under no obligations, and it will be one of my pleasures.

I can use more beeswax, and am now paying 31 cents cash or 33 cents in exchange for goods.

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References: Any Plainfield business firm listed with Dun or Bradstreet.
Five per cent discount on all dozen orders received before March 1.

KENNITH HAWKINS, . . . PLAINFIELD, ILLINOIS

Special Sale of Honey

WE HAVE produced a fine lot of extracted honey this season from our eight out-yards. In addition to our own honey, we have purchased many other lots from prominent producers, and are now able to offer for prompt shipment the following flavors of extracted honey:

ALFALFA,	ORANGE,
SWEET CLOVER,	LIGHT AMBER,
WHITE CLOVER,	DARK AMBER,
BASSWOOD,	BUCKWHEAT.

Several of the last cars of comb honey which were shipped us in 1913 contained a large number of cases of broken comb honey, caused by the cars being badly handled in transit.

We are obliged to regrade all shipments; and in every case where we found broken combs we melted them up. All the combs that are slightly cracked or have the cappings broken, we put into other cases; and these cases of cracked comb honey, which is practically all produced from white clover, we are offering at a special low price and at prices which we believe will certainly be of interest to you; and we know that, if you will send us in an order, you will be pleased with the honey at the prices we are asking for it.

We have other choice grades of Fancy and No. 1 white comb honey, as well as Fancy and No. 1 amber comb honey, and during these months we are making special prices to our regular trade.

A request will bring special prices.

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Gleanings in Bee Culture

Published by The A. I. Root Co., Medina, Ohio.

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VOL. XLII.

FEBRUARY 1, 1914

NO. 3

Editorial

OHIO BEEKEEPERS, TAKE NOTICE.

WE wish to call the attention of Ohio beekeepers to the program (as given on page 119 of this issue) of the convention to be held at Athens, February 12 and 13. We know that no effort has been spared to make this meeting a great success. E. R. Root will be in Florida at that time, but H. H. Root expects to be present.

RAINS IN CALIFORNIA.

JUST as we go to press we have the following from Mr. Chadwick, our correspondent in California:

We have just had a four-inch rain, and our prospects are much brightened in consequence. Mendleson says that we shall get the largest honey crop in years, the winter having been open and warm.

The morning papers to-day, Jan. 27, are telling of a terrible rainstorm yesterday in parts of Southern California—the worst ever known. We doubt whether so much water falling at once will do as much good as it would if it came more slowly; but certainly from the beekeepers' standpoint the outlook is the most promising of any season in recent years.

BEEES AND POPPIES.

FOR the past few months there has appeared in the newspapers in various forms a story of bees becoming stupefied by working on poppy blossoms. The various items have included the names of different parties, and certain details have been so obviously exaggerated that we have thus far given the matter very little thought. During a recent conversation with A. H. Berno, of Mansfield, Ohio, he said that last season on several different occasions when his bees were bringing in honey rapidly he found them working on poppies; and each time, after about a day, he said he could see a large number of bees lying about on the ground near the poppies, unable to fly, which bees, however, would finally recover and generally get back to the hives by night. He cut down the poppies, and in about a week the bees were working again as usual.

Mr. Berno is the florist at the Ohio State Reformatory, and he has had considerable experience with bees as well as with flowers. If others of our readers have had opportunities for making similar observations we should be glad to hear from them.

PROF. A. J. COOK VINDICATED.

WHEN an honest and capable man tries to do his duty fairly and impartially, in a public office, especially if he does not favor some chronic office-seekers, he is pretty sure of inviting a fusilade of attacks. Prof. Cook, ever since he has taken the position of State Horticulturist of California, has had criticisms of one form and another hurled at him at different times. Matters finally came to a culmination recently, during which the opposition called a hearing before the Governor. Not a single charge was proven true. Prof. Cook was thoroughly vindicated on every point.

Our readers will be glad to know this, because Prof. Cook has been so well and so favorably known for so many years back by the entire beekeeping world.

LESS WATER USED IN MAKING HARD CANDY.

THE following note from C. H. Howard, Boston, Mass., came in too late for insertion elsewhere in this issue, and we thought best, therefore, to give it here as some might like to try the plan that he suggests in making candy for use late this winter.

In your recipe for making hard candy you say, "Into a dish of hot water on the stove pour an equal amount of sugar, stirring constantly." I have made hard candy for bee-feeding for years, and do as you say, with this difference: I use one part water to six parts of sugar, and usually boil from five to ten minutes. I think you will find it quite a saving of time if you try this amount of water.

We tried using less water than the amount stated in the directions in our January 1st issue, but we had difficulty in getting all the sugar dissolved at once. If any sugar remains undissolved by the time boiling commences, the candy is sure to crystallize. It is true that it takes a little longer time to evaporate this extra amount of water, but

it seemed to us the easier way. Possibly others might think differently. At any rate, we should be glad to have reports from any who may try both ways.

A COURSE IN APICULTURE AT THE IOWA STATE AGRICULTURAL COLLEGE.

IN keeping with many of the other progressive States, Iowa is to have this spring a course in beekeeping in connection with the State Agricultural College at Ames. This course is to be an eminently practical one, and the students are to be given daily lectures upon different phases of beekeeping, no text-book being used. In this the plan will be similar to the one carried on at some of the other institutions where beekeeping is taught. Briefly, the course will consist of one lecture and one laboratory period of three hours per week for half a year. Among other things will be taken up a study of the anatomy, physiology, development, and habits of the bee, including practice in general apiary methods, the handling of bees and their products, the races of bees, diseases, etc.

COVER PICTURE.

THE view shown on the cover gives a glimpse of some beautiful apples hanging in the trees just before picking time. No amount of careful blending of printer's ink can bring out the rich coloring, and we are glad that we made no attempt to imitate the natural tints. This picture, and the ones on pages 95 and 96 were taken last fall in the fifty-acre orchard of Van Rensselaer & Southam (see article by Mr. Van Rensselaer on page 94). Very close to this orchard is situated our Stone Hill yard, a part of which is shown on the cover of our July 15th issue. The spraying outfit used was also shown on the cover of our June 15th issue. Messrs. Van Rensselaer & Southam are enthusiastic over the value of the bees as pollinators, and they want even more bees, if possible, next season.

Is it at all strange that the most progressive and successful fruit-men do not need to be told of the value of bees as pollinators, nor of the bad effect on the fruit itself of spraying in full bloom?

BEEES AND GRAPES.

DURING September and October we usually hear of one or more instances of trouble arising between beekeepers and grape-growers because of the supposed injury that the bees do to the grapes in biting or stinging holes through the skins of the grapes and sucking the juice. Of course, it has been

shown many times that bees can not do this; that birds are the real culprits, after all, and that the bees merely suck the juice from the fruit that has burst because of being overripe, or that has been punctured by birds, and is, therefore, unmarketable. To get the grape-grower to believe this when he sees the bees with his own eyes working on the juice of the grape, is rather difficult.

There is some difference of opinion as to whether bees pollinize the blossoms of grapevines. Our Mr. Marchant says he has seen bees working on the blossoms in the South, and he believes that bees do cross-pollinize grapevines.

In our own apiary we have very large crops of grapes on the vines growing at each stand; but we confess that we ourselves have no absolute proof to offer one way or the other. We should be glad to hear from any of our readers who have such proof; for if it can be shown that the bees pollinize the blossoms of the grapes as they do of so many other fruits, this fact will go a long way toward overcoming the prejudice against the bees that exists in the minds of some of the grape-growers.

MISBRANDING AND ADULTERATION OF SPRAYING MIXTURES.

IN this special number on bees and fruit it may be pertinent to call attention to the fact that fruit-growers, besides having to be extremely careful as to the time for spraying, must also pay strict attention to the quality of the solution which they use for spraying. In these days of adulteration it is a favorite practice on the part of many sensational writers seeking for a little more notoriety to call every thing adulterated, even comb honey, as our readers know. However, the United States Department of Agriculture in a recent statement for the press has called attention to certain cases of adulteration and misbranding that the fruit-growers among our readers would do well to notice. Because of our lack of space we are unable to use the whole statement in question. The following is the introduction: GOVERNMENT WINS INSECTICIDE AND FUNGICIDE CASES.

WASHINGTON, D. C.—The Government has recently secured judgments against a number of concerns for violations of the Insecticide Act. These involve the misbranding or adulteration of insect-powders, moth-balls, roach-exterminators, and various other insecticides and fungicides shipped in interstate commerce. Following is a résumé of each case:

We can not use the résumé of each case, nor is it necessary here to mention all of the cases listed. The following, however, being instances of adulteration or misbranding of preparations used for spraying will be of interest:

"Persian Insect Powder," shipped by Lewy Chemical Co., New York; "Orchard Brand Atomic Sulphur Fungicide," "Orchard Brand Arsenite Zinc," "Orchard Brand Atomic Sulphur Combined with Arsenate of Lead," "Bordeaux Arsenate of Lead Mixture," "Bordeaux Mixture," all shipped by Thomsen Chemical Co., Baltimore, Md.; "Kerosene Oil Emulsion," "Lime, Sulphur, and Salt," or "Horicum," "French Bordeaux Mixture," the last three shipped by Benjamin Hammond, Fishkill-on-Hudson, N. Y.; and "Lead Arsenate," shipped by Fred L. Lavanburg, New York.

A careful reading of the article by "A New England Veteran," page 91, will convince almost any one, we think, that spraying is often greatly overdone; or else it is done injudiciously by persons who are following unreliable directions, or, worse still, following no directions at all. If spraying is done in a haphazard manner, perhaps it is just as well that the solution used be adulterated.

Up-to-date fruit-growers and beekeepers will do well to pay especial attention to the emphatic statement by Prof. H. A. Surface, in the extract on page 93, copied from the *Practical Farmer*. We wish that all the farm papers would publish such a statement. It would have more weight than the same thing in a bee journal, because the bee journal is supposed to be prejudiced in favor of the bees.

"INVESTIGATIONS PERTAINING TO TEXAS BEEKEEPING."

THE above is the title of Bulletin No. 158, by Wilmon Newell, State Entomologist, and F. B. Paddock, Assistant Entomologist, and by William Harper Dean, formerly Assistant Entomologist at College Station, Texas. Seldom do we run across a bulletin from any station that contains more interesting and valuable matter on the subject of bees than does this one. Mr. Wilmon Newell, State Entomologist, is an enthusiastic beekeeper. Unfortunately, he is not in position where he can devote all his time and energies to the subject of bees; nevertheless, he and his assistant have given us some valuable experiments, all of which are recorded and given in the bulletin mentioned above.

DOES IT PAY TO DIVIDE IN RUNNING FOR COMB HONEY?

Wilmon Newell, unlike many experts, sees not only the scientific but the practical side of bee culture. In the two first pages of this bulletin he gives the results of some experiments regarding swarm control that are exceedingly valuable—val-

uable because he has gone after the work from the standpoint of the trained scientist. One of the problems he has tackled is, "Which is the more profitable—to prevent a colony from swarming, and thus conserve its strength, or divide it into two colonies early in the season and have both of them gather honey?" He admits that the consensus of opinion is in favor of the colony not divided. He selected a number of colonies—one set he did *not* divide, and the other set he divided, giving a part of them queen-cells and a part laying queens at the time of the division. The colonies that had the laying queens had the advantage. He says: "It seems a safe conclusion that, had the ones which were provided with ripe queen-cells at the time of division been provided with laying queens instead, their production would have been at least as great as the others. The conclusion is justified that the purchase of queens for these colonies, even at a price of one dollar each, would have been profitable, inasmuch as this would have increased the average production of these colonies by 30 lbs. of extracted honey." The average from colonies that were divided had 114 lbs. of surplus; that is to say, the combined surplus from the two after division was 114 lbs.

In the apiaries where the colonies were *not divided*, which either did not swarm or which were prevented from doing so, gave an average of 127 lbs. surplus per colony, or 13 lbs. more than the ones that were divided. "But," says Mr. Newell, "we obtained from divided colonies not only a surplus of 114 lbs., but a colony of bees," which he puts at the very low price of \$3.00. Looking at it this way, and figuring the honey at 7 cents, the difference in favor of division was \$2.09.

METHODS FOR CONTROLLING SWARMING.

With regard to the methods for preventing swarming, he found that increasing the size of the brood-chamber delayed it in some cases and stopped it in others altogether. Increasing the super room did no good. Shaking on foundation stopped the swarming and gave an average of 137 lbs. each. Colonies which did not swarm gave an average of 121 lbs. "One might be inclined," he says, "from a consideration of these figures, to suppose that the shaking treatment had actually increased the production. But such a conclusion would not be correct." The shaken colonies had the advantage in that they were stronger in the first place than the colonies that did not swarm.

THE LIFE HISTORY OF THE BEE MOTH.

Perhaps the most striking thing in this

bulletin is the life history and control of the bee moth, by F. B. Paddock. This is the most elaborate and complete treatment on the subject that we have ever seen; and while we believe that the author unduly magnifies the bee moth as a serious enemy (and it doubtless is such among the box-hive beekeepers of Texas), he has nevertheless given us a story that supplies many gaps in our knowledge of this pest. Its life history is illustrated by numerous fine half-tone engravings. It would be almost impossible to give a review of this magnificent piece of work, because it should be read entire in order to be understood. It is so well done that we shall beg the privilege of making it over into one of our booklets when the supply of this bulletin has been exhausted.

This treatise on bee moth is followed by a critical study of Texas beekeeping, by W. H. Dean. Some of the figures are interesting in showing the importance of the beekeeping industry in Texas. In spite of what Mr. Dean says to the contrary one would be surprised to find so large a number of beekeepers who keep black bees in old box hives. This fact will explain why the bee moth is really a serious enemy to some beekeepers in Texas. Mr. Dean summarizes his report as follows:

The average production of honey, all grades, per colony in Texas for the season of 1911, as secured from reports of 2733 beekeepers, was 26 pounds. Were the production from box hives eliminated from this estimate, the average would be much higher in spite of adverse seasonal influences.

Bulk comb honey ("chunk honey") is the chief production of the Texas apary. It follows extracted honey and sections, the latter form being comparatively scarce.

In the data expressing the views of Texas beekeepers as to whether apiculture is profitable as a side line rather than as a profession it is interesting to note that the most extensive beekeepers maintain that the industry is *unprofitable* unless conducted on a large scale, and that those who claim the industry is profitable *only* as a side line are almost invariably beekeepers who follow the calling on the corresponding scale.

DISTURBING BEES IN WINTER.

In the *American Bee Journal* for December is an article from G. M. Doolittle on this subject. In a general way he advises against it; but toward the latter part of his article he gives some testimony that goes to show that it may not be altogether an unmitigated evil. We quote:

I have many times proven that such disadvantage was overbalanced by the advantage gained along other lines. Let me give one or two illustrations:

When I had been keeping bees some two or three years a farmer living two miles distant advertised 27 colonies for sale in box hives at \$5.00 each. This was considered a big price at the time, but, like any beginner, I was anxious for more bees, so I went to see them. He kindly consented to let me look them over, which I did by carefully tipping the hives on

the benches they occupied, as they were wintering outdoors. I found that most of them were light in stores, and that there was only one colony in the lot that I considered worth the \$5.00. I offered \$5.00 for this one, which he took. I wrapped it in one of the sheets I had brought along, put it on the opposite side of the cutter seat which I occupied, turning it bottom side up, and drove home in the twilight of a cold evening in the fore part of January. I well remember how the bees roared, as the sleighing was poor, and how I inwardly censured myself for not leaving them where they were until spring, as "such a disturbance as this" would surely cause them to die. When they got quiet, about 10 o'clock that night, I carried them to the cellar where the rest of the bees were, took the sheet off, and set them in their place beside the others, still bottom side up, as in the early 70's we always wintered bees in box hives that way.

No more of the farmer's bees were sold, and imagine my surprise to find on going there one day the last of April, that all but two of the 26 colonies left were dead, while the one I had disturbed "nigh unto death" was one of the best colonies I had. It gave a good swarm that year and stored 129 pounds of "box honey."

After our great loss of bees during one winter in the latter 80's, a winter extremely cold and long drawn out, the claim was made that the bees "froze to death." I did not believe it, but claimed that no chance to fly during five months of "long confinement" was the cause. The argument "waxed so hot" that one afternoon the next winter, when the mercury stood at 12 degrees below zero, I took a colony of bees, and, with cover and bottom-board removed, suspended the hive a foot above the ground, leaving it thus for 36 hours, during which time the mercury got as low as 23 degrees below. This colony was then put on its old stand again, and came out in May fully equal to any of its fellows which had no disturbance above the usual winter's elements.

In conclusion, allow me to say that, if there is any thing in this article that would seem to show that the disturbing of bees in winter does no harm, I protest in advance against the assumption that I advise such disturbance. I do not so advise except where some gain is expected.

We do not know but that we agree with Mr. Doolittle that the average person, perhaps, should avoid disturbing his bees in midwinter. It is a good deal like a case of spreading brood in the spring, and, we may say, spring feeding. But there are many things that the average beekeeper should not attempt, but which an expert can practice to advantage. We do not say that all experts under all conditions can disturb bees in their cellars and get an increase of 25 and even 50 per cent; but there are some who can do it. We have accomplished it two different seasons, and have succeeded nicely with one lot of bees in our cellars thus far.

Mr. Doolittle, in the second paragraph from the last, above quoted, shows that the one colony that was disturbed was the *only one* out of the whole lot during that severe winter that came out in good condition, while the *undisturbed* colonies nearly all died. Now, then, what an expert should do is to discover the conditions under which an increase can be secured in the cellar.

Stray Straws

DR. C. C. MILLER, Marengo, Ill.

L. W. CROVATT thinks, p. 27, that his experience would convince advocates of unpainted hives "that paint is valuable in the preservation of wood." Friend Crovatt, I think they agree with you that paint is good for the hive, but they think it isn't good for the bees.

I SUPPOSE Italians are not alike in the matter of capping. At any rate, my Italians have hardly tallied with what Bro. Doolittle says about their dark capping, p. 9. With a few exceptions there has hardly been a noticeable difference in the capping of my Italians and blacks or hybrids.

DRONE JUICE FOR UNITING.—In *Rhein. Bztg.* it is recommended to mash up drone brood, thin the juice with a little water, and then sprinkle bees with it to make them unite peaceably. [We should be afraid that, under some conditions, this would result in fearful robbing. Moreover, mashed-up brood of any kind is liable to cause stinging also. We certainly would not advise beginners to try it if they do not want to get into trouble.—Ed.]

J. E. CRANE, if you mean that four-foot board to be used for the whole apiary, p. 879, it seems to me your record will be crowded. If you mean one for each colony it must take quite a lumber-pile. You say glue makes leaves of a book stick together. I've glue galore, and the leaves of my books are daubed with both glue and honey, yet it makes no serious trouble in the space of 50 years or so. How it might be as a permanent practice I can't say.

WILLIAM TANNER has my thanks for a package of genuine German lebkuchen made in Nuremberg. I'm sending you a share, Mr. Editor. In Germany these lebkuchen associate honey with Christmas in a way not known in this country. [The samples came duly to hand, and they are certainly very fine. It is to be regretted that in this country we do not have this German custom of eating this honey-cake lebkuchen during Christmas. The recipe for lebkuchen will be found on page 33 of our booklet of honey recipes.—Ed.]

I'D LIKE to know what Mel Pritchard looks like. Is that he, p. 28? [Yes. His picture appears on pages 27, 28, 29, also on page 892 of our issue for Dec. 15. On page 888 appears a picture of our Mr. Marchant, who is now in Florida with our 300 colonies. Mr. Ray, another one of our apiarists, appears on page 891. Mr. Mel Pritchard

makes smokers when he can not work with the bees. Mr. Ray goes out selling honey, and Mr. Marchant is taking care of our southern apiary. We always endeavor to keep our beemen busy the year round.—Ed.]

IN Germany "early breeders" are disapproved, colonies that start brood-rearing later being considered more successful. It begins to look, p. 3, that you were reversing that rule at Medina. [Here is a case where locality would have a bearing early in the spring in Northern Ohio. In the cellar especially, we should say if brood-rearing can start by the first of January, and be maintained from then on till the bees are taken out of the cellar, it will mean stronger and better colonies. Of course, one has to guard against starvation. Unless the bees are supplied with candy or unsealed stores, they may not do much brood-rearing.—Ed.]

LAYING WORKERS.—As reported in *Ill. Monatsblaetter*, Silvester Hirsch unqueened a normal colony, took away its unsealed brood, and gave it from time to time frames of sealed brood. During all this time, of course, the bees could rear no queen, neither did laying workers appear. Then he gave a comb with brood four or five days old, but nothing younger. The bees immediately started queen-cells, but destroyed them before maturity. The worker brood proceeded to maturity, and, shortly after the emergence of the young workers, eggs were found, two to ten in a cell—of course from laying workers. He thinks extra food produced laying workers. Whether they can always be explained in this way is a question.

I HAVE always believed that a worker never stings a queen, for if it did why should a queen live for hours when balled? One day last summer, while I held a queen in my hand a worker jumped upon it, and in a jiffy that queen was a dead queen. But I still think that a balled queen is rarely stung, if ever, perhaps because in the ball it is impossible for a worker to get into proper position to sting. [There have been so many reports that the bees have actually stung a queen to death inside of a ball, and we have had so many cases of it in our own yards, that we should say that death by suffocation was the exception and not the rule. It will be remembered when this matter came up years ago, we stated that we had repeatedly had queens stung in the thorax when pulled out of a ball of bees.—Ed.]

Notes from Canada

J. L. BYER, Mt. Joy, Ont.

A mild winter so far, here in Ontario. At this date, Jan. 10, we have not yet had zero weather. But there is lots of time for real cold weather yet, as from now till Feb. 15 is the time we usually get our most severe snaps. Although the weather is mild, yet the air is not warm enough to stir the bees up any, and from all appearances they are wintering nicely so far.

* * *

DECEMBER BROOD-REARING A DOUBTFUL DESIRABILITY.

Brood-rearing is going on nicely in December, page 3, Jan. 1. May be all right for Medina, but none of it if we can avoid such a thing for us in this locality. If those bees could not be taken out of the cellar till some time late in April, as might happen here in Ontario, I feel that so much December brood-rearing would spell disaster. Although the editor tells of weak colonies going into the cellar and coming out strong in the spring, I must say I am very skeptical about such a thing being possible in ordinary practice, to say the least. If there is any thing I feel sure about, it is that brood-rearing, especially out of season, is very hard on the vitality of the bees raising said brood, and that is the reason I have always been opposed to the policy of early spring feeding for stimulative purposes.

* * *

OUTDOOR WINTERING MORE IN VOGUE IN ONTARIO.

Judging from what one reads in GLEANINGS lately, the indoor method of wintering seems to be popular around Medina, O. This seems strange to us chaps away north here in Ontario, as the present tendency is more toward outdoor wintering all the time, and I suppose the climate of Ohio is much milder than with us—indeed, from the very fact that we are so much further north we no doubt have much colder weather than they have down there. This fall I have received letters from a number of beekeepers who are north and east of me, and where cellar wintering is mostly practiced, the writers declaring their intention of trying the outdoor plan next season. While I have in every case advised caution in changing from a plan that has given fair satisfaction to that of a system in which they have had no experience, yet I believe that the outdoor plan can be safely followed in many localities where it is commonly thought to be unsafe to try to winter outdoors. We have

370 colonies wintering outside exactly 100 miles straight north of Toronto; and while this is but our second winter in that section, I am not worrying much as to the outcome.

* * *

BEEES AND FRUIT.

This is an alluring combination that will have a tendency to make many city dwellers anxious to take a try at the "back to the land" policy. In a small way, fruit-growing goes nicely with commercial beekeeping; but unless competent help can be obtained, the specialist beekeeper is better to have just enough of the smaller fruit for his own use. They come in at the same time as the honey harvest; and as many of us could say from experience, we don't feel much like picking fruit for market when the bees are rushing us good and hard.

Late apples, pears, etc., come on at a time when they can be handled better by a beekeeper; but then the most of the commercial beekeepers do not have a large acreage of land to farm, so this line is out of the question. However, "bees and fruit" appeals strongly to this scribbler, and some day I hope to be able to settle down with one apiary and have the time and pleasure of reveling among all the choicest kinds of fruits that our climate will stand for. This is one of my dreams. Whether I shall ever be in position to realize its fulfillment or not is another question.

* * *

BOATS FOR TRAVELING TO BEE-YARDS.

What Mr. Scholl has to say in the Dec. 15th issue about Grant Anderson, of Texas, simply reaffirms what I stated some time ago on the subject of motor boats. Without a doubt, if I were starting in beekeeping again, and could find some locality suitable for honey production that had a navigable stream running through the country, that is the place I would choose to establish a series of out-apiaries. As mentioned before, we have a gasoline-launch at the yard north of Toronto, 100 miles, and it is certainly the ideal way to get around nicely and cheaply. Unfortunately the river is not navigable far enough for us to put any more apiaries on its banks; but the boat has demonstrated its usefulness along the lines indicated by Mr. Scholl. No tire troubles annoy us, and no bad roads stop you at any time in the season when working with the bees. Then again, the launch is not so expensive to buy or maintain as is an automobile. But I am sorry to say we have few locations around

us with the necessary navigable waters, so I shall have to use the means of traveling at my command, and be satisfied.

* * *

FIGHTING AMONG BEES OF THE SAME COLONY.

A. C. Miller is, in my opinion, quite a keen observer. I say this in all sincerity. In just the same spirit, I can not help expressing the opinion that he sometimes makes claims to things as being facts when common practice seems to say there is nothing in his contentions. Writing in the *American Bee Journal* on the theme of queen introduction, odor, etc., he says that, when some colonies have combs with adhering bees taken from them, if these combs with the bees adhering are stood outside the hive for ten minutes or so, against trees, buildings, etc., when returned to the hive again there will be violent fighting among the lot united again, so that a quarter or more of the colony will be destroyed. Now, I don't pretend to be much of an observer; but I don't believe this can be possible and not be noticed by men handling hundreds of colonies for years. In some old systems we used to have of finding queens in populous colonies for purposes of dividing for making increase, etc., often have we had the combs separated for much longer than ten minutes, and never once can I recall seeing a "scrap" such as Mr. Miller refers to. Of course, friend Miller says "some" colonies, so perhaps he has something out of the ordinary. But at present I am inclined to think he has stated very emphatically something that will be hard to prove to be correct in actual practice.

* * *

BROOD-REARING IN SEPTEMBER AND OCTOBER.

"Only young queens, thirty days or younger, will lay during the months of September and October in the Northern States," p. 777, Nov. 1. Isn't that putting it a little strong? Any way, if it is true of the Northern States, it is not the case in Ontario, still further north. At the Cashel yard I had 16 colonies in single-walled hives—increase made in July, all queens being of that month's rearing. They were left very late—too late, in fact, before being transferred to double-walled hives. October 29 they were lifted into the winter hives, each comb handled singly. Fourteen of the colonies had brood hatching in two frames, while two had three frames each. Of course the frames were not filled with brood, as the colonies had been fed heavily for winter. A few of the colonies had too much space with no honey, to suit me; and when brood was hatched they were given some more winter stores. In no case did I observe un-

sealed larvæ; but as I handled the frames rather rapidly I may have overlooked any if it was present. But the comparatively large amount of hatching brood was *prima facie evidence* that these queens had been laying all through the first week of October, and they were at least three months old.

* * *

BEES GETTING INTO THE WRONG HIVES.

That bees in an apiary mix up a great deal is a well-known fact; but it is only when unusual conditions prevail that I have a chance to see how much mixing is really done, and to get an idea of how any disease that might be carried by bees would soon spread all through an entire apiary. At the Cashel apiary the bees are nearly all Carniolan and their crosses, only a very few pure Italians being in the yard. In the row furthest west, which contains about 25 colonies, there is one hive of pure golden Italians, the workers being about as solid yellow as any I have ever seen. It is needless to say these bees are very conspicuous when mixed with other colonies of dark bees, and I was much surprised during the past season to see how these goldens have mixed up with their neighbors. For at least 30 feet on each side of the hive they come from, golden bees may be found in all colonies; and while some are present in the row back of the one they are in, not nearly as many show up as in the hives in the same row. On one side of this hive its neighbor *hive* is exactly the same in color, and I should judge that about one quarter of the inmates are golden. On the opposite side of the hive the next neighbor is of a different color, and very few goldens are mixed with them. Still further away on the same side as the different-colored hive, the next one is of the same color as the one with golden bees, and in this hive the yellow fellows show up very plentifully. This would seem to show that the young bees are attracted by the same-colored hive, as they certainly have not gone into the dark hives near them to any great extent. The colony of goldens does not seem to have so many dark bees, so they have not gained any by their indiscriminate mixing with their neighbors, and it looks as though they are not as good home-finders as the dark bees. I remember G. B. Howe telling me that there was always a much greater loss in mating among Italians than with the darker races; and from my experience of the past few years I am ready to endorse that idea, as I continually find a much greater loss among Italians in cases of supersedure, etc., than is the case with the Carniolans and other dark bees.

Beekeeping in California

P. C. CHADWICK, Redlands, Cal.

SELLING HONEY THE SAME WAY THAT ORANGES ARE SOLD.

This will not reach its readers until after the meeting on market at Los Angeles is past history, and I have not felt that it was my business to attend the meeting, as I am not on the committee; but I have thought many times, and still think, the only logical way to handle this marketing business would be on the lines on which the orange business is handled. This plan could be followed out successfully if properly managed. Not only would the beekeeper be saved the profits of a middleman or two, but the buyer would get the honey at a figure that would let it reach the retailer and ultimately the consumer at a reasonable figure. The orange-marketing system as followed in California to-day is one of the most sane and satisfactory of any system of marketing of an agricultural product. I might profitably give a synopsis of the workings of the California orange pool, and explain the advantages.

There are really several pools in operation at some of the packing-houses at the same time. For instance, we first have the Christmas pool. This includes all of the fruit picked and shipped for the Christmas trade, and closes about Dec. 10 as a rule. All growers who put fruit in the pool receive the same for their fruit of the grade they furnish. Then there is the season's pools, and pools of various lengths during the season. It is the season's pool of which I will speak principally, for it will serve my purpose best in comparison. The holiday fruit is, as a rule, not included in the season's pool, but all of the remainder of the shipping season is included which runs over a period for the navels from Jan. 1st to near the first of June, varying a little according to the season. The fruit is hauled into the packing-houses and weighed, set aside, and the boxes marked. When they are ready to pass over the grader, an account is kept of the amount of the different grades as well as the culls. These records are compiled from day to day as the fruit of the individual comes in until all of his fruit has passed over the grader. At the end of this period the entire amount is added, so many of such and such a grade, and so many culls. The great advantage in the season's pool is that the grower receives for his fruit exactly what every one else in the pool receives, or an average for the entire season. If the market happens to be bad in New

York or Chicago for a week or so, and the price runs down at those points, the grower need have no fear of his fruit being sold cheap on that market, for after his fruit is packed it loses its identity, and no one knows or cares where it goes, and the result is that no one man gets all of the high prices nor all of the low, but the average for the season is figured on the entire amount, as so much per box, and the grower gets the average on the number of boxes he furnished for the season. When the fruit is packed the packers will advance a certain amount on the fruit shipped.

This plan could be followed in handling our honey without any great outlay of capital. Honey in the warehouse, covered with insurance, is considered gilt-edge security by our banks. There could be a central selling agency from which all of this business could be handled, and a pool agreement signed for the season. When I had, say, 50 or 100 cases of honey stored I could take a warehouse receipt for it, get it insured, and forward it to headquarters; the manager could go direct to the bank, present the receipt and borrow on it, which in turn could be mailed to me in the form of a draft or check. This, at the end of the season, would be deducted from my returns for the season. An inspector could be put on the road to travel and check up the amount of each producer of the grade his honey would be classed under. If, for instance, there were ten beekeepers in Redlands who had honey stored, it could be inspected, graded, and reported to the selling agency as to the amount of the different grades. The selling agency could in turn sell a car of a certain grade and order it loaded and forwarded to a certain point. The beekeeper always needs money *right away*, and in this way could be satisfied, and yet help to hold the crop directly in the hands of our own agency. This would eliminate also the habit of buyers traveling through the country, paying a difference in prices ranging as high as two cents for the same grade of honey in the same locality from different producers.

I know this could be done if the beekeepers were ready to back the agency, and would put the honey market in the hands of the beekeepers instead of allowing the buyers to place arbitrary prices on our crops.

I have written something on this line previously, but desired to enter a little more into details at this time.

Beekeeping Among the Rockies

WESLEY FOSTER, Boulder, Col.

IS THE SUPPLY LIKELY TO BECOME GREATER THAN THE DEMAND?

Boulder County produced over three hundred thousand pounds of honey the past season—that is, ten carloads, and all comb honey. One of the smallest counties in Colorado produced twice the comb honey that a city like St. Louis can consume in a year. Forty beekeepers produced all the comb honey that two million people eat. There is something wrong, and conditions must be changed, or we shall see worse ahead in honey-marketing. When a State like Colorado produces enough comb honey to supply twenty cities like Kansas City with their supply, consumable production and overproduction are drawn on pretty close lines. Western beemen must shortly bestir themselves in the line of educating to honey consumption. They are now paying heavily for their blindness to the narrowness of the market for comb honey. A bumper crop will put us in bad shape every year it comes.

* * *

HEAVY SNOWFALL IN COLORADO.

Northern Colorado has had the heaviest snowfall in the writer's seventeen years' residence in the State. All together more than 40 inches of snow fell, completely covering all hives. Concern for the safety of the bees was immediately felt by the beekeepers, as the snow was very heavy and wet. Some began at once to shovel out the hives, opening the entrances by digging a trench along in front of the rows of hives. Others, through lack of experience, shoveled out the hives and set them on top of the snow. A large proportion of the beemen, however, left their colonies covered up, as it was found that the warmth of the clusters had melted the snow away from the four sides fully eight inches. Fear, however, was felt that, when the snow began to melt, it would form a slush at the entrance, and freeze at night, closing the entrance and smothering the bees. The writer shoveled his hives out by throwing the snow back over the tops of the hives, leaving a trench clear to the ground along in front of the entrances. In this way the hives have the protection of the snow on the remaining three sides and the top. The entrances can be watched, and any danger of freezing quickly remedied. However, we have had

several warm days, which have melted the snow close to the entrances nearly all away, so that danger is now practically past.

* * *

ALFALFA PROSPECTS FOR THE COMING SEASON.

The precipitation for 1913 was nearly 19 inches, or 4 inches above normal. This was caused by the big snow late in November and early in December. Abundant water for irrigation is assured, and we hope the present good prospects will continue.

Alfalfa is our main dependence for honey. The fall rains put all the clovers in prime condition, and the heavy snow has protected the clover since winter came. The ground is not yet frozen, January 3, and it is not probable that the snow will be gone for another month. Alfalfa is injured more by winter and spring freezing than in any other way. The snow so far has prevented winter-killing, and the usual winter pasturing has not been done. The late spring freezes are the most serious injury that can come to the alfalfa; but these will be less destructive as the hardier varieties are more generally grown. It has been demonstrated that the deep-green alfalfa will stand much more freezing without injury than the light-green varieties. With the selection of better varieties, and their more general cultivation, we may expect more uniform crops of alfalfa honey every year.

The varieties of alfalfa that the beekeepers and farmers may well enthuse over are the Grimm and Baltic varieties. They have proven superior in hardiness, tonnage, and seed production. The southern varieties which originally were introduced into South America from Spain, and then brought north, make up the bulk of our commercial varieties now grown.

There is another important characteristic of the Grimm and Baltic varieties: They begin blooming before getting full growth. Fully ten days to two weeks of honey-gathering is provided for the bees before the alfalfa is ready at the earliest to cut. It is reasonable to suppose that varieties heavier in seed production are more valuable for the honey-bee, and this is another point where the northern varieties excel.

May the time soon come, as it undoubtedly will, when the hardiest of the northern varieties will be universally grown. As selection goes on, it will not be long before the hardiest varieties will be still further improved.

Conversations with Doolittle

At Borodino, New York.

CONTRACTION OF THE BROOD-NEST.

"In an old paper I read that much more honey can be obtained when the brood-nest is contracted than where the bees are allowed to have their whole brood-nest to work in as they please. If contraction is profitable, I want to make my dummies this winter."

Much depends upon what contraction is used for, and when it is used. The advocates of an eight-frame Langstroth hive use this size of hive for the purpose of securing an early rush of bees into the sections. They consider this the best way of getting a larger yield of section honey from white clover and basswood, as with this small hive the bees have little chance to store any of this honey in the brood-combs where very prolific queens are used, the brood from such a queen (and the necessary pollen needed for this brood) keeping the combs of the brood-chamber filled so that, where any honey of any amount is stored, such must go into the sections.

Some of our most successful apiarists of the past have claimed that a hive, even smaller than the eight-frame L. hive, gives still better results, and so have used dummies to take the place of one or two of the outside frames, thus using a six or seven frame brood-nest. They take these dummies out after the white-honey flow so that the bees can fill the frames, which now take the place of the dummies, with fall or dark honey for their winter stores. However, such contraction, where a colony has a good queen, is liable to bring on swarming; and when the fever is once contracted it is hard to control, the prospects for a good yield of honey often fading away through the continued efforts to swarm, unless the colony is shaken or some other manipulation used, either to draw off a part or all of the working force from their brood, or take a part of the brood away.

On the other hand, with an ordinary or poor queen a gain can be made at the commencement of the white-honey flow by using a dummy for every frame not occupied wholly or in part with brood. Otherwise the combs not having brood in them will be filled with honey, the queen still further crowded down, resulting, as a rule, with little or no honey in the sections.

The advocates of a ten-frame Langstroth or larger hive are quite sure that all contraction of the brood-chamber can only result in a smaller crop of section honey, reasoning that, according to their views and

experience, any contraction is a most unwise course to pursue. In the first place they claim that we need to raise all the bees possible before the opening of the main harvest; that we must have an abundance of these workers or the harvest will be in vain, and to rear these workers there must be plenty of available cells. Second: In a hive we need all of the cells which a good queen will keep full of brood, and enough other cells for the storing of pollen and the needed daily allowance of honey that is necessary for an abundant supply to stimulate the whole household to its fullest degree. Then, when the coming harvest finds these combs all filled with brood, pollen, and honey, there is nothing to be gained in taking out some of these combs and putting in dummies; for if the brood-nest is full when the honey comes, the surplus must go into the sections.

Then there are others using large hives who claim, where the season is poor up to within a week or so of the expected harvest, thus allowing several of the outside combs to be empty of any thing, that the best means of getting the bees into the sections, with the first flow of white honey, is to feed an inferior honey until these empty combs are filled the same as they would be had the season been good, thereby placing them in a better condition than would be possible by using dummies.

Then contraction is practiced and advocated by some of our most practical beekeepers using a ten-frame L. hive, which is, the hiving of the large swarms sent out from these large hives on six or seven frames, using dummies to fill out the rest of the hive; and in a locality where the surplus white honey is gathered in a short period of from two to four weeks, this is generally a profitable mode of procedure. Especially is this the case where the flow from white clover and basswood is followed by a dearth of honey for a month or so before the flow from buckwheat or fall flowers begins. Under such conditions it often happens that one of these large colonies will get profitably at work in one, two, and sometimes three supers of sections, when, all at once, out will come a large swarm. If they are returned, more likely than not the bees will keep on attempting to swarm till the harvest is over, resulting in scarcely a section of marketable honey. By hiving this large swarm in a contracted hive on the old stand, transferring the supers to the newly hived

Continued on page 112.

General Correspondence

HELP! WHOLESALE SPRAYING OF BLOSSOMS CAUSING WIDESPREAD DISASTER IN EASTERN MASSACHUSETTS

BY A NEW ENGLAND VETERAN

It was with great pleasure and satisfaction that the writer read of the forthcoming "bee and fruit" number of GLEANINGS—not only from the anticipation of the enjoyment of reading something good—we have learned to expect that—but there comes the belief that the powerful influence of this widely read magazine may relieve the present situation in Eastern Massachusetts which has already gone far to destroy the beekeeping industry and interest of Essex, and, to a considerable extent, of other counties. That the matter is of vital and immediate importance to the gardener and horticulturist is obvious.

In the matter of disease, while realizing fully the seriousness and the difficulties which beset both inspector and owner, the writer is optimistic, and from experience believes that in time it may not only be controlled, but, by eliminating the careless and ignorant beekeeper, raise the gentle craft to a higher and more satisfactory plane.

For some thirty years bees have been to me at first a study and recreation, then my occupation, and have brought very satisfactory returns.

Although surrounded by salt meadows and hard-wood forest-land, the fact that we are in the "apple belt," and that our farms are well tilled, has made the flow of nectar sufficient to give reasonable profits, and the aroma and flavor of our honey is such that there is no difficulty in selling locally all we can produce. In my home yard a sale of 25 swarms and a trifle over half a ton of comb honey has been a fair summer's work; but it is neither unfair nor exaggerated to say that, for several years, the authorities have taxed my bees in April and destroyed them in May. My crop last year was 42 lbs. of honey—no swarms; and after heavy feeding, and the purchase of many queens, the apiary is reduced in value one half below spring count and appraisal.

With the advent of the gypsy and brown-tail moths there came the covering of the face of nature with, first, Paris green, of which two-edged-tool people had a wholesome and well-grounded fear; but later, with the arsenate of lead, of which they seem to have no fear at all; probably because, although it is quite as dangerous, and in some

ways even more deadly, it was free from the evil reputation of Paris green, and was to most people a new substance—merely an "insecticide." It now sells at five cents a pound, and is to be found in the barns and sheds of most people who own trees or cultivate gardens.

Frankly admitting, as I do, the absolute necessity of its use, it is still a good thing to remember that it is a very powerful cumulative metallic poison, but very imperfectly soluble in the water with which it is applied; and, once exposed, is practically indestructible as a poison, although it may undergo some unimportant chemical changes by oxidation. Its value is in its ability to kill!

Let me be plainly understood that the beekeeper is, or should be, the first to acknowledge that, where these pests have appeared in any considerable number, the only course is to spray; but unless done at the proper time, and intelligently, it will defeat its own purpose. In this I find the men at the head, "the men higher up," are entirely with me. The ignorant employer, the farmer who does not know what he is doing, or, worse yet, does not care, or who is working on the absurd theory that filling the blossom with poison will kill the codling moth, not knowing that this moth takes no food of any kind, are the ones who have practically destroyed beekeeping and the wild bees in this locality.

You may have more patience to listen to my sermon if I set down here something of the damage done last spring to the bees under my personal care and observation, other than my own.

One yard of ten colonies in excellent condition, just beginning work in the supers, reduced by the second week in July to two nuclei. These were inspected, and pronounced free from disease. They had during the summer a loss of thirteen queens. Neither care nor expense was spared in the effort to save them.

Another apiary of six strong colonies was reduced to five weak; no swarms nor harvest. Two small apiaries were entirely wiped out. A market gardener, reduced from five to two; an apiary of three reduced to one nucleus. A yard of five reduced to

two, and here every thing was done to save them, expense not being considered. A yard of seven was cut to three, this being an especially interesting case, as they developed two mild cases of European foul brood, giving positive evidence that a case of foul brood properly treated is of less injury than "spraying in bloom." This list could be extended, covering my work in both Essex and Norfolk counties. Of all the bees under my care or advice, only two lots did any satisfactory work. One colony was kept in a cucumber-house until the spraying in bloom had passed, returned a very handsome profit, and gave two swarms which went into the winter nearly as strong as the parent colony. Another yard of four, on a large estate where the spraying was controlled, and both bees and fruit protected, increased to six and gave some 200 lbs. of fancy comb honey. Under normal conditions this is a good locality, and not greatly troubled by disease.

To consider this question fairly and from all sides, one should bear in mind that the cutting out and killing of most of the willows under the belief that they promote the increase of the gypsy moth has deprived the bees of their early pollen; and hence, unless artificial pollen or pollen substitutes are supplied, the bees do not build up early enough to get the apple-bloom honey into the supers. This works out as of much greater importance than one would think. Also the cutting and burning of all roadside shrubs and bushes to destroy the moths supposed to be distributed by automobiles takes away in the aggregate a large amount of nectar, miles of elderberry, sumac, golden-rod, asters, etc.

The filling of a "ripe" apple-blossom with a solution of arsenic may not be the most healthful treatment for the blossom; but I am a beekeeper, and will not attempt to discuss botanical matters.

To say nothing of the money loss, it is not pleasant to see the yard covered with little bunches of bees quivering in the agony of arsenical poison, for arsenate of lead is "slow and sure," and the torture may continue for hours. A neighbor came in haste to ask what was the matter, for his onion-bed was, as he expressed it, "covered" with dead and dying bees.

The loss is not by the beekeeper alone, but the entire community is damaged, as shown by the fact that a large strawberry-field a short half-mile from my yard failed to fruit, although blossoming freely. The owner, an expert at the business, declares that, as my bees were practically the only ones available, their destruction caused his

loss, which he estimates at \$200, and it was to him a very serious matter.

Many who have enjoyed cultivating gardens are giving them up, as they depend on the bee for their early cucumbers and squash. The practical extermination of the bumble-bee has been the chief factor in raising the price of red clover from 12½ to 45 cents per lb., and farmers no longer buy. Surely the loss of this valuable forage plant is not to be ignored. In spraying, especially with an engine of five to ten horse power (town machine), and in reaching tall elms and other shade trees, a wide area is covered, both around and beneath the tree; therefore much clover, both white and red, is filled, as the blossom is well adapted to receive and hold the poison. In this case the nectar serves to carry the poison; but my observation and experience convince me that the chief damage is by pollen, which soaks up and retains the arsenic; hence the slow building-up of a poisoned colony. The nitrogeous fool as stored up in the cells kills both old and young.

Of this very serious aspect of the case I have observations and experiments, but will not take space to give them here. A thing difficult to prove is that queens receive poison directly from the honey-sac of the worker, either as food or drink; but I am convinced the very great mortality among queens following spraying in bloom can best be explained that way.

Do not think the writer wishes to minimize the danger or damage of the moth pest. Eight wood lots lying in four towns, and all, so far as any future profit is concerned, absolutely ruined by the moths, are quite enough to convince him that we face a "condition and not a theory," but if we are to use a powerful poison by the ton—and three tons per year will hardly supply this small town to spray its highways and a part only of its orchards—let us use it intelligently; and as that is enough to kill all the inhabitants in the State, with a ton or two left over, why not use it carefully?

Is there need to say this? Well, judge for yourself. A year or two ago the person in charge of the spraying in this section assured me that arsenate of lead, which he termed, with a considerable degree of accuracy, "arsenic of lead," would "not hurt any thing that breathed through the mouth." This might be a valuable bit of information for the doctors who condemn "mouth breathing," and at any rate it showed his profound knowledge of respiratory processes.

Last spring the owner of a valuable horse which was drawing a part of the spraying outfit offered, if I would, as he expressed it,

"put up fifty dollars," to feed a pound of the poison to the horse. I was assured by other employes that, where their dinners had been wet down and accidentally "soaked" by the spray, they took no harm, and "would as lief eat the stuff as not." "It killed my bees," said one, "but it was only one swarm, and this is a pretty good job."

I was assured a few days ago that forcing the poison into the blossom "gave a much better color to the fruit;" and I was told, but can not vouch for the fact, that a certain large orchard was sprayed on the mature or nearly mature fruit to preserve the color and prevent any skin fungus.

Few realize the danger of a cumulative poison; but the progress can be observed on the song bird or the toad that eats the dying larvæ—if an insectivorous bird or a toad is left to die next summer. There may be a few, but they are mostly gone.

It should be noted that the poison is quite attractive to the bee, either because of a sweetness in this form of lead, or, as some believe, by the mixture of an adhesive like the "molasses" from the sugar-beet manufacture, which, as a waste product, is very cheap and effective.

This arsenate is extremely adhesive; and if spread upon the fully developed leaf it will remain effective for the fall crop of brown-tails; but I know an old nurseryman who says he does not like to have "the lungs of his trees" clogged up all summer, and asks, "Why not spray when the leaves are small, kill the larvæ when they also are small, and have done less damage; then let the leaf and fruit develop?" That sounds sensible to me; but he is past 80, and so, probably, is wrong.

It is unavoidable that some poison be taken into the hive from the foliage, espe-

cially as wet up by dew, rain, and rarely by honey-dew! but that is a loss the beekeeper should bear patiently. No one is to be blamed; and the loss, as compared with that resulting from spraying in bloom, is trivial, although where large areas of forest land are sprayed it will destroy the bees in the immediate vicinity.

Late spraying is also destructive to the various parasites and predatory insects which would, could their numbers be sufficiently increased, keep both gypsy and brown-tail in check. This part of the question is sufficiently important to be discussed in a paper by itself, and by a more competent person than I.

In reviewing this article I am convinced that I have not put this very serious matter too strongly, but, rather, that I have not expressed it forcibly enough; neither have I touched upon the loss of domestic animals by the careless and excessive use of the poison, nor upon the injury to the new growth and more easily injured parts of the trees and plants which it is intended to protect.

The United States Department of Agriculture, our very efficient State Board, the Agricultural College, and many officers of the Gypsy-moth Commission and State Forestry, are doing all they can to spread information and explain "safe and sane methods." Even the dealers in the poisons print (in some cases) warnings not to use in bloom; but still the evil increases, and only yesterday I was told by a man who had planned to set a rather large orchard in the spring that he had abandoned the idea, for, as he expressed it, "They have killed my bees, and won't let me keep any more, and I can't fertilize my blossoms by hand."

NEVER SPRAY FRUIT-TREES WHEN IN BLOOM

An Extract from the Practical Farmer

[The following article, coming as it does from the *Practical Farmer*, a paper not directly interested in bees, has all the more weight. Notice that the emphatic reply is from our old friend Prof. H. A. Surface.—ED.]

A fruit-grower, who should by this time know better, writes to State Zoologist Surface, Harrisburg, and asks: "What kind of spray is best to use when peach-trees are in bloom?" Prof. Surface is anxious to have the substance of his reply reach every person who may even be interested in the least in the subject of spraying. He says that it should be "proclaimed from the housetops and written in the schoolrooms." The reply is emphatic, and based upon years of experience and study. It is as follows:

"I note with interest that you make inquiry concerning the kind of spray to use while the trees are in bloom. Again I hasten to say that you are decidedly wrong. Please get it out of your head now and for ever, for your own sake and that of your crop as well as for the bees, that no trees, shrubs, bushes, or vines of any kind should ever be sprayed while in bloom. Please tell this to your neighbors. Please tell it to the editors of all the papers. Proclaim it from the housetops. Let everybody learn that, to

spray a tree while in bloom, is liable not only to injure the fruit and thus help to destroy the crop, but also kills the bees and other insects that are absolutely essential in carrying pollen from fruit to fruit, and thus help fertilize the blossoms and insure a crop.

"If there is any one thing against which there should be definite and emphatic legislation in this State at the present time it is the ignorant and absurd practice of a few persons who yet appear to spray while in bloom. Please help us to educate the people against this practice. Education as practical and rational as this would do much more than legislation, as growers, if educated on this point, would understand it is greatly to their disadvantage to spray while in bloom. This fact should be placed before each schoolteacher, and kept on the walls of each schoolroom of the State. Let us make it strong. Tell every schoolteacher in your county to write on the blackboard in capitals: 'Never spray while in bloom.'

"Another reason for not spraying while in bloom is that there is no need of it. There are no pests that must or should be killed or prevented at this time. It will not do any-

where near the amount of good that it would to spray before the blossoms appear, and again after they fall. Before the blossoms open, spray with the boiled lime-sulphur solution, either home-made or commercial, boiling one pound of lime and two pounds of sulphur in one gallon of water for one hour, and dilute this with about six or seven times its bulk of water, and spray the trees thoroughly and before the blossoms open. About the time the leaf buds are swelling is the best time. This is good for all kinds of trees, shrubs, and bushes. After the brown husks of corollas fall from around your peaches and plums use this same preparation, but ten times as much water as you would at the other time; and to every fifty gallons of the extremely dilute preparation add two pounds of arsenate of lead, and spray again. The first spraying here mentioned is to kill the San Jose scale and certain other insects and plant-disease germs. The second spraying is for the curculio that makes wormy fruits, and when used on pome fruits, or apple, pear, and quince, it is for the codling moth and certain other insects and diseases."

REDEEMING BY CAREFUL PRUNING AND SPRAYING, A BADLY NEGLECTED APPLE-ORCHARD OF SOME 50 ACRES

BY J. L. VAN RENSSELAER

That Ohio is equal to and perhaps even better adapted for the raising of apples than are Oregon and other western States, has been thoroughly demonstrated this fall by W. H. Southam and myself. Early in the spring of 1913 we rented what is commonly known as the Wm. Bennett farm, just south of Stone Hill, in Brunswick, Medina Co., O. The farm consists of 200 acres with approximately 55 acres of orchard with 1400 apple trees. The farm was leased for five years of Mrs. Frank Isham, 47 Beersford Road, Cleveland, O., with the privilege of buying at the expiration of the lease. We took possession of the farm in January, 1913, and immediately set about pruning and trimming the badly neglected trees until we had the entire 55 acres of orchard in the best of shape, with all the dead and diseased limbs removed and burned before the warm weather of the spring arrived.

The orchard was in a worn-out, run-down condition, and for years had borne but a scanty crop of wormy and ill-shaped fruit; but this fall, under careful management, thousands of bushels of perfect fruit have been harvested.

The first spraying was done with a lime-and-sulphur solution while the buds were dormant. The second was done when the buds began showing pink, early in the spring, with $3\frac{1}{2}$ pounds of arsenate of lead, to $1\frac{1}{4}$ gallons of lime and sulphur to 50 gallons of water. The third and practically the most important spraying was done when the petals showed first signs of falling; and the fourth followed within ten days after the third. The fifth commenced July 1. The same formula was used for the last four complete sprayings. As a result of careful work the pickers found on an average but one wormy apple in a bushel of all apples harvested.

One year ago, 25 acres of this orchard had almost no leaves, and it has been years since this portion has had any apples at all. By these regular sprayings this same orchard had perfect foliage, and practically every tree in the orchard was very heavily loaded with perfect fruit.

The orchard presented one of the most beautiful sights imaginable, with the hundreds of trees, and their branches bending to the ground, heavily loaded with beautifully colored fruit. There are trees of al-



A pile of 500 bushels of perfectly formed apples—not an ill-shaped one to be found. Intelligent spraying and perfect pollenization by the bees, responsible.

most all of the old standard varieties, without a poor variety among the 1400 trees.

It required about six weeks of continual work on the part of the staff of pickers to harvest the enormous crop of fruit. Tents were erected, and the pickers had a jolly time camping out, which added spice as the work was being accomplished. The results have been a revelation to farmers for miles around, and the orchard is attracting State-wide attention.

Fifty swarms of bees were placed in the orchard by The A. I. Root Co., which greatly aided in pollenizing the blossoms. We find the bees very beneficial to our crop, and we advise each fruit-grower to secure bees to aid them in this great work.

We have proven conclusively that the apple-orchards in Ohio have long been neglected, and that the Buckeye State is wonderfully adapted for the raising of apples which will rank with the best in the country.

NO FRUIT SETS IF THE WEATHER IS COLD DURING BLOOMING TIME, SO THAT THE BEES DO NOT REACH THE BLOSSOMS

BY J. W. ROUSE

We know of no two other businesses that fit so well together as bees and fruit-growing, as neither interferes to any great extent with the other, and each of these pursuits needs the other to succeed well.

Bees can do without fruit-bloom in early spring, as they are compelled to when it is too cold or wet for them to work on the bloom when out; but in many cases the

fruit-trees do not do nearly as well as when bees work on the bloom. We would not pretend to say that *no* fruit could be grown without aid of insects to carry and distribute pollen, yet in many cases it is true that, unless insects do do this work, the trees often fail to set more than a very little fruit. Horticulturists are agreed that fruit-trees should be located so that the different kinds



A close view of some of the apples just before they were picked (see preceding page). Notice how thickly they are clustered, and that every one is a perfect specimen. See also the cover picture for this issue.

may blossom at nearly the same time so as to distribute the pollen properly. The wind often aids in this work; but in unfavorable weather, if the winds are contrary, or dur-

ing a wet time when no insects can get around, it often happens that no fruit is set. Even under the most favorable circumstances insects are a great help in the proper

distribution of the pollen, as they mix it to a great extent, and thus in a large measure prevent in-breeding, which is so detrimental to fruit-growing in most instances. Many of the leading horticulturists are now agreed that bees are a great help in fruit-growing.

One of the most extensive fruit-growers, who has a great many orchards in different States, says that he always wants bees in or near his orchards, as in so many cases they are a necessity to growing fruit by properly securing fertilization of the bloom.

As has been stated before, there are other insects that work on fruit-bloom besides bees; yet, as most people know, in early spring in blooming time, when it is so necessary for the insects to work on the bloom, bees are much more plentiful than perhaps all other kinds together, especially when bees are kept in any great quantities, as the bees live through the winter in colonies, whereas other insects live as individuals, and have to breed up. In many cases they are too late for early fruit-bloom. As an illustration, bumble-bee queens winter singly, so that, when the first bloom of clovers

is on, there are only a very few of these bees; but by the time the second crop comes on, the queen bumble-bee has raised large families, and there are great numbers of them at this time; so the second crop of clover—especially red clover—is the crop that has the seed, the first crop having but very little. If it had been properly fertilized it might have as much seed as any crop.

In our observations in the past we have noticed that in a wet time, when bees can scarcely get around, but little fruit sets on the trees. During one wet cold time the sun came out for a while, and we had one pear tree on the east side of a house that the bees worked on an hour or so. This tree set fruit, and had pears on it, and no other of our trees or any others in our neighborhood, so far as we know, had any pears on the trees that season. If fruit-trees are so protected that bees can not visit the blossoms, little or no fruit will set. In all our experiments on this line we have never had any fruit to set if the bees could not get to the bloom.

Mexico, Mo.

500 PERFECT COMBS FROM FOUNDATION HAVING WIRES IMBEDDED OUT OF LINE.

BY W. N. RANDOLPH

[The following article was written last spring, but our correspondent had neglected to send it to us until the publication of the article by H. H. Root on the same subject in our Nov. 15th issue. We are glad to place it before our readers here as an additional endorsement of the plan of pulling the wires out of alignment when imbedding.—ED.]

It seems that, with all that has been written on the subject, it would be exhausted; but I am satisfied that we have a lot to learn yet in all departments of beekeeping. Believing this, I will give you my plan.

I use the Hoffman brood-frames with full sheets of foundation, and with four wires imbedded in the wax across the frames. I use the frames with grooves and wedges in the top-bar to hold the foundation fast at the top; but I find in practice that the heat of the hive will very often loosen the foundation, and the bees drag it down and make a mess of things, even with the wedges pressed firmly in. In order to prevent this I pour a tiny stream of melted paraffine along each side of the foundation where it joins the top-bar, to hold the foundation secure. I use the paraffine because it costs only 9 cents per lb., while the wax is worth 30 cents, and the bees do not seem to notice the substitution.

In wiring I use the spur imbedder. There is a point in wiring that is overlooked; the top strand of wire should be pulled down

slightly in the center, and the bottom strand should be pulled up in imbedding, so that the bottom wire will brace against the pull of the top wire, and prevent the wrinkling or buckling of the foundation. The two middle wires should run straight across the frames. This will give smooth straight and strong combs, with the wires braced as in a suspension bridge, and the wires will take the jars from the combs as they were intended to do. The wires should not be pulled down too tight or a job of buckling may be the result; for while outside the hive the foundation may be cold and stiff enough to offer sufficient resistance to the pull of the wires and look just right when it is in the hive, and the heat of the bees softens it, it will often give way to the pull of the wires.

I used this plan in making some 2400 combs a year ago, and an equal number last season, and nearly or quite all of them made perfect combs.

Do not give your nice new prepared combs to the bees until a honey-flow is on and they are secreting wax. Remember to



Peach tree that blossomed in cold weather and bore a good crop because it stood so close to the bees.

run new extracting-combs gently through the extractor the first season used; for when new they are very fragile. After the first season they will get tougher each year. It is strange that, while the bees will always

store honey first in the old combs, they will start queen-cells in the nice new combs in preference, even if they have to move eggs from the old combs to the new.

Letohatchee, Ala.

PEACH TREES NEAREST THE BEES PRODUCED THE BEST CROP

BY S. H. BURTON

Dr. C. C. Miller, page 517, Aug. 1, says he has always had just a little doubt as to the statement that bees are of more value as fertilizers than as honey-gatherers; but the cranberry business, p. 479, July 15, may yet remove all doubts. I herewith submit some photographs of our peach orchard which may help to dispel any doubts. Dr. Miller may be from Missouri, and have to be "shown."

We have eight colonies of bees located in our packing-shed, with the entrances facing east. These stands are set on a bench, and the alighting-boards extend through an opening in the wall. When the peach trees commenced to bloom it was nice balmy weather, and the bees were flying finely; but by the time two-thirds of the blossoms were out the weather turned very cool with a cold rain following. For a period of ten days we had damp, cool, muggy weather, and the bees did not venture far from home. However, as our packing-shed and the bees are located right in the midst of the peach-

orchard the first row of peach trees directly in front of the shed, and about 30 feet from the alighting-boards, were loaded with peaches, while the second row of trees from the bees showed more fruit on the side next to the colonies than on the off side. At the rear of the farm, across a five-acre lot, the peach trees averaged about two dozen peaches to the tree, all the same variety, Carmans; all trees had equally good care as to spraying, pruning, and cultivation. Now, I don't say that the bees are entirely accountable for the great showing of fruit on the trees next to the hives, but it does look as if the weight of evidence was in their favor. Of course, some one will say that the shed had something to do with it; but one tree at the corner of the shed, and not protected by it from the prevailing cold winds, had more peaches than any of the rest. This tree stands within five feet of the hive, and just at the side of the line of flight. During the cool spell referred to above I noticed that very few bees were

working on the peach bloom on the further side of the orchard, I having some work there which caused me to take note of the fact; but I never thought to observe if they were working on the trees near the shed; but since the trees have fruited I have studied over the matter.

By the way, if any beeman wishes to set a good variety of peach he can not miss it on the Carman. It gets ripe here about three weeks ahead of the Alberta; comes on

the market after early peaches are gone, and is fine for canning or dessert. It is an early and prolific bearer, and very hardy in bud. The orchard shown is five years old, and producing its first crop of any consequence. We are able to market every peach at home at \$2.00 per bushel, and the people cry for more. Next spring, if we have indications of a good peach crop I shall scatter the hives through the orchard and note results. Washington, Ind.

COLONIES WINTERED OUTSIDE RUNNING SHORT OF STORES

BY A. C. GILBERT

No doubt, owing to the very mild weather up to Christmas, thousands of colonies of bees will die before March from lack of stores in the northern sections of the United States if not looked after. None of our hives have racks on during the winter, as they are all removed in the fall when all colonies are examined to ascertain that all have a sufficient amount of stores. At the time of removing the racks, small cobs are first laid on the top-bars *a la* Dr. Miller, over which a piece of cotton cloth or burlap is covered; then the chaff tray or cushion is placed in proper position. At any time in the winter any colony can be examined very easily by lifting off the chaff tray or cushion and turning up the covering a little from over the top of either end of the top-bars; and as the bees will generally be closely clustered at this season of the year, the amount of stores and number of bees can be ascertained very readily. Some colonies will be found to cover a large portion of the combs; often less, and perhaps some may not occupy one-third of the combs. The last mentioned may have several combs of honey to spare. At the same time it will be a great benefit to such a colony to have the frames of honey removed and the division-board moved up, thereby making them far more comfortable, and putting them in better shape to pass through the rest of the winter, also lessening their chances of being robbed.

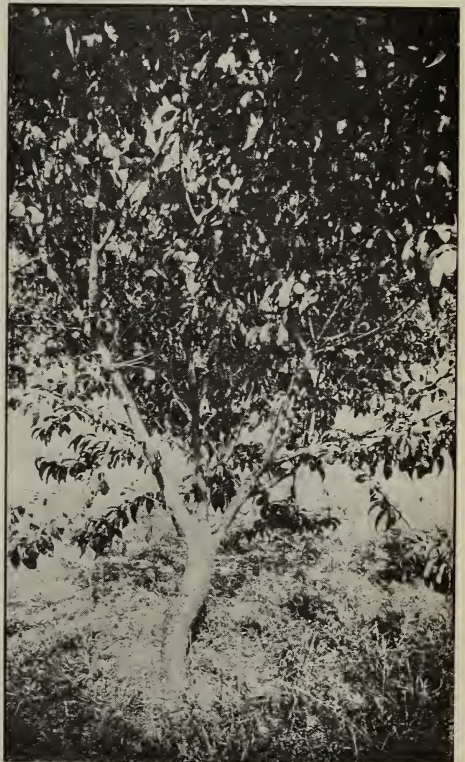
We have saved many of the largest colonies by dropping in two or three combs of honey along in February and March on even a cold day without harming them in the least by the operation. Some very populous colonies which apparently have a great plenty of honey in the fall run short, especially in a mild winter, when so much more is consumed.

One season we lost several of the largest colonies in the yard from starvation along in March. Since examining them as stated

we have lost none. It would be a good idea to heed the editor's warning in the Dec. 15th issue. *Don't let your bees starve.*

SNOW-COVERED COLONIES.

We doubt whether it is a benefit to have the snow drift entirely over the hive. From what experience we have had it is best not to have much snow around the hives if it can be avoided—that is, to have it come up



A peach tree that blossomed in cold weather, and did not produce a good crop because so far away from the bees they could not reach it.



Members in attendance at the Iowa State Convention, Des Moines, December 12-13, 1913.

very high on the hives. Before building a high tight board fence back of the hives in our apiary the direction the snow generally drifts from, most of the hives were frequently completely buried in the snow; consequently the bees in those hives would commence to breed too early, which greatly excited them, causing a greater consumption of honey, which, with the dampness and

sweat, would generally bring on dysentery, etc., while the bees in other hives where the snow did not drift on them were entirely free from the disease, and wintered in fine shape. By the way, not much has been written lately about the above disease and the pollen theory since the days of the late James Heddon.

Honeoye Falls, N. Y.

THE SECOND ANNUAL CONVENTION OF THE IOWA STATE BEEKEEPERS' ASSOCIATION

BY H. H. ROOT

When a few Iowa beekeepers first became enthusiastic over the possibility of an organization among the beekeepers of the State they were told that there were too few beekeepers, and that they were too widely separated to make the plan a success—that it had been tried before and abandoned, etc. Nothing daunted, however, they started in to do their best at perfecting an organization on the assumption that "where there is a will there is a way." How well their efforts and the efforts of others who helped succeeded is best told by the convention picture which appears above, but the picture does not show all the members in attendance by any means. In all there are now about double the members of a year ago. Good for Iowa! The second annual meeting was a success in every way, both in point of attendance and enthusiasm.

A large amount of honey was contributed by the members for the Salvation Army Christmas dinner, and a jar of honey was also sent to Governor Clark for his Christmas table. To encourage the use of honey at Christmas time, large display cards were furnished all who desired them, bearing the words, "Eat Honey for Christmas Dinner."

As I was able to be present at but one session, I shall make no effort to give a general report of the convention beyond the synopsis of the president's address and a brief report by J. W. Stine, which follows. I secured several papers that had been read, parts of which will appear in later issues.

SYNOPSIS OF ADDRESS OF PRESIDENT FRANK C. PELLET.

1. Only one State of equal area ranks ahead of Iowa in the value of her bees.

Iowa far outranks Colorado, Idaho, and other western States of greater area whose possibilities are so widely advertised.

2. With proper encouragement Iowa can soon rank first, area considered, as a honey-producing State. Only California and Texas, with their great size, are now far in advance.

3. The society has secured the passage of a foul-brood quarantine law, and better support for the inspection work the past year. Also greatly increased attention in the way of better premiums and facilities at the State and county fairs.

4. The greatest need of the beekeeping industry in Iowa now is a better understanding on the part of the public of its importance to the State, and better methods of production and marketing on the part of the beekeepers.

5. Instead of asking for increased support for the bee-inspectors' office the beekeepers should begin a campaign of education to the end that the treatment and prevention of diseases be better understood and that inspection be less needed as a result.

6. The use of second-hand honey-containers and other equipment should be discouraged unless thoroughly disinfected, as this has been a source of much of the spread of foul brood.

7. The society should endeavor to work out some system of crop distribution that would net the producer better prices without injury to the consumer. Too much honey is shipped to commission merchants

in Chicago to be sold to jobbers, who in turn sell it back to grocers near at hand. The securing of a list of all persons who desire to purchase honey, by the secretary of the association, who will place said list at the disposal of every member of the association, will be a step in this direction. If grocers wishing to buy honey knew that, by writing the secretary, their wants would be placed before all the leading beekeepers of Iowa, they would readily take advantage of the opportunity.

8. A system of regular crop reports from each county should be developed, to the end that the probable production may be ascertained early, and prices governed accordingly.

9. The society should appoint a committee to look into the possibilities of co-operative marketing by members of this association.

10. The beekeepers should endeavor to secure an extensive campaign of education through the State Department of Agriculture, the agricultural college, and other avenues, rather than to attempt to secure further increase in the support of bee-inspection work at present. Better understanding, on the part of the beekeepers, of bee diseases will largely reduce the necessity for inspection by a State official.

11. Beekeepers should begin a campaign to establish the use of honey on every table for the Christmas dinner. The Salvation Army and other charities should be provided with honey for the poor who are unable



Julius Johansen, of Port Clinton, Ohio, standing under a pear tree loaded with blossoms and bees. The apiary is just back of the greenhouse out of sight.

to buy it for such occasions. With a little effort honey could easily be made as essential to holiday dinners as cranberries have become already.

THE DISCUSSION ON FOUL BROOD
BY J. W. STINE, *Deputy Bee Inspector.*

One of the topics of special interest to those having diseased bees, or who had near neighbors with diseased bees, was the paper on the foul-brood situation in Iowa by Mr. Edward G. Brown, of Sergeants Bluff. He told of a very interesting and practical way of dealing with American foul brood. The plan in brief was as follows: Take the diseased colony and shake or brush all the bees from the comb and hive it in a hive with starters. Insert an empty comb in

place of one frame, with the starter, thus giving a place for the bees to deposit the diseased honey. As soon as the honey has been deposited, probably by the next morning after hiving, take away the comb of honey and insert a frame with a starter. All the combs built from the starters are saved by this method.

The beekeepers of Iowa as a whole seem quite willing to co-operate with the inspectors in getting rid of disease among the bees. As a matter of fact, the work of the inspector is educational; and when the beekeepers are all willing to become educated along apiarian lines, especially with bee diseases, there will not be the need of the field work of the inspector that there is now.

FRUIT-GROWING SO GENERAL THAT BEES CAN NOT MAKE A LIVING; YET THE FRUIT-MEN ARE BUYING MORE BEES

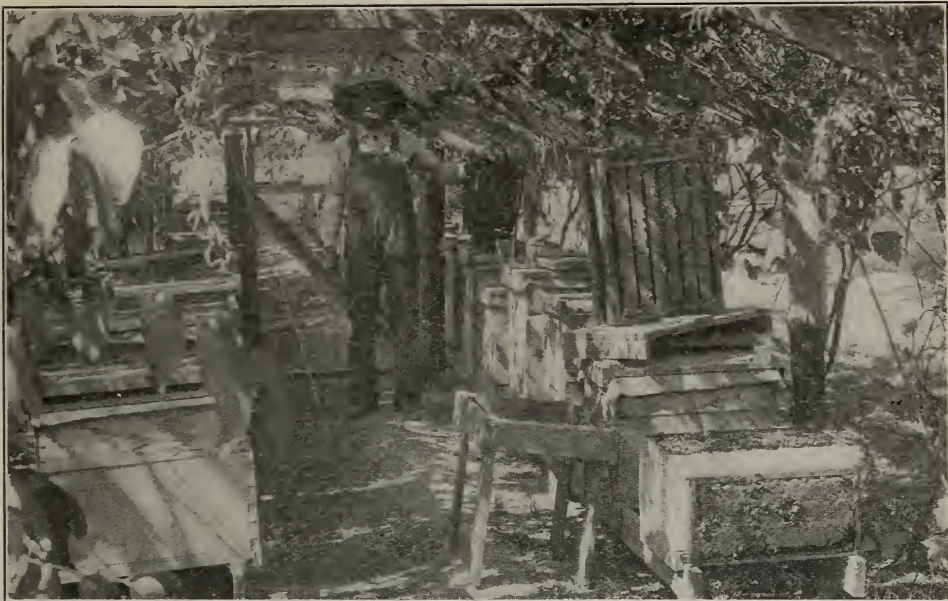
BY JULIUS JOHANSEN

On the so-called "Peninsula," Danbury, and Catawba Island, fruit-growing has become so general that the farmers there buy their own feed stuff, every available foot of ground being planted to fruit. It is only when an orchard has become too old, and is, consequently, pulled out, that the land is planted to farm crops a few years to in-

vigorate it, as they say. Then it is planted to fruit again.

Most of the farms are small—many only ten or twenty acres, with very few above 40.

Many of these small farmers were also beekeepers on a small scale a few years ago. They kept eight or ten colonies each: and one of whom I knew had 25 or 30. How-



Apiary of D. S. Zedeker, Parlier, Cal., consisting of 151 colonies, all located under a grape-arbor. Why don't the bees "eat the grapes"?

ever, as fruit-growing became so general, the bees failed for lack of food, I think. Not able to get what they wanted, they took what they could get—honey-dew, I suppose. Some have asked me why their bees made nothing but black, bad-tasting honey. On account of it the colonies often died through the winter.

After most of the bees had died the fruit-growers began to realize that some certain varieties of peaches did not do so well as they did when there were bees to visit the trees. This was especially noticed by a Mr. R. Shumardebeck, an extensive fruit-grower, and a keen observer of nature. He called on me, and asked for the loan of some

bees. He said that, since his neighbors' bees were dead, he scarcely saw a bee in his orchard; and since then this variety of his peaches had given very small crops.

Well, he got the bees, and hauled them six or seven miles; and after fruit-bloom was over he brought them back again full of honey. In the fall he brought me some peaches, and said the bees had greatly benefited his crop. At this time he also made arrangements to get some bees for the next spring.

Since then I have heard that some of the smaller growers have stocked up again for the sole benefit of their fruit.

Port Clinton, Ohio.

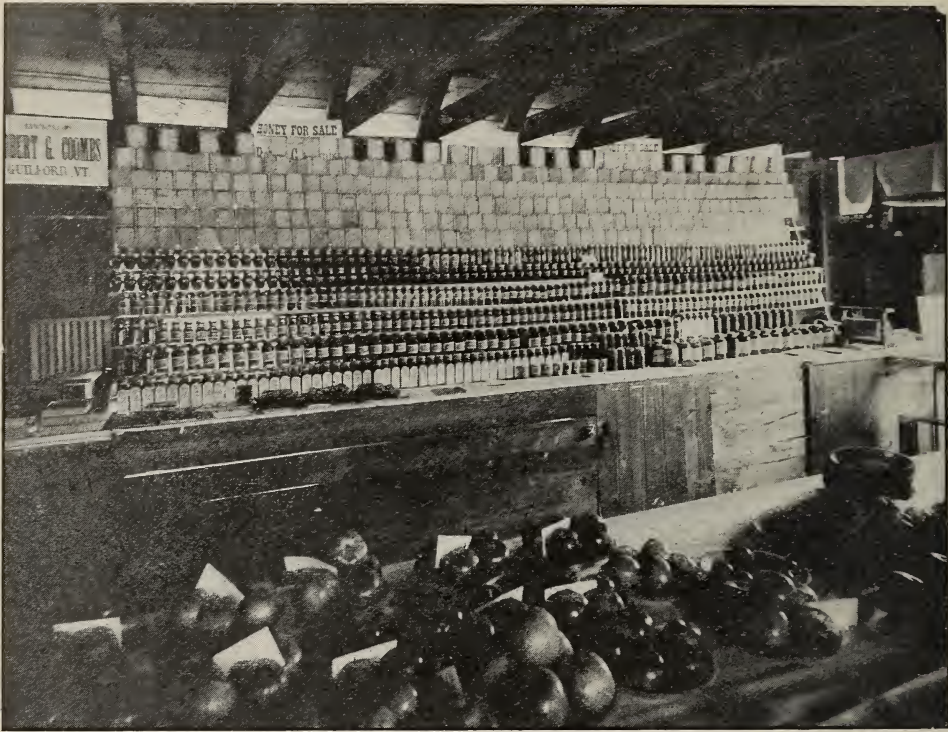
EXCELLENT HONEY DISPLAY AT THE BRATTLEBORO (VT.) FAIR

BY DR. BURTON N. GATES

Assistant Professor of Beekeeping, Massachusetts Agricultural College

The Valley Fair, held at Brattleboro annually, has the New England reputation for superiority of the materials exhibited in all classes. This September Mr. Robert G. Coombs, of Guilford, made an especially attractive display of bees, wax, appliances, and comb and extracted honey. For the honey display, as shown in the illustration, Mr. Coombs used the massing effect. This was accomplished by means of shelving arranged in graduated steps. A further

unique and desirable feature was the illumination of his display by numerous electric lights in the rear. This added materially to the brilliancy and sparkle of his products. The fair being held after cool weather had set in precluded the possible disaster from the entrance of robber bees which might have attacked the exposed comb honey. To obviate this difficulty, as has been previously mentioned, the Connecticut Beekeepers' Association have prohibited the display of



Honey exhibit at the Brattleboro (Vt.) Fair, 1913. This is an excellent set-up of the local product. Note the brilliancy obtained by the electric illumination from the rear.

comb honey which is not glazed or otherwise protected from the attack of bees. The glazing is further advisable from the sanitary standpoint. Another feature which Mr. Coombs might have utilized is the glass shelving so much liked by those who display in Connecticut. Glass shelving, of course, facilitates the transmission of light and adds to the brilliancy of the exhibit.

Mr. Coombs is, by the way, an enthusiastic and progressive beekeeper. He informs the writer that, from 131 colonies, he

secured 1793 pounds of fully capped comb honey and 2209 pounds of extracted honey. Mr. Coombs also raised upward of 1000 queens, and has, besides, handled upward of 400 colonies of bees, a part of which was the increase from his yard. He puts into winter quarters about 131 colonies. The nectar flow in his locality is largely clover and raspberry. By judicious manipulation it is estimated that at least 500 colonies may be supported in the vicinity.

Amherst, Mass.

THE OPINIONS OF SOME FRUIT-MEN AS TO THE VALUE OF BEES

Location for Outyards Provided by the Fruit-men who also do all the Hauling Necessary

BY J. M. DONALDSON

On page 790, Nov. 15, the editor says: "We believe the time will soon come when beekeepers living in fruit districts need pay no rent for out-apiaries." With me that time has already come. When I moved into the fruit-belt of New Jersey, long before I

had increased my bees enough to make out-apiaries necessary, I began receiving requests from fruit-growers to place bees in their orchards, owing to the fact that they wanted the bees more than I did the locations. I was able to make bargains with



J. M. Donaldson's apiary, located in the Ballinger orchard. Mr. Ballinger is so anxious to have the bees there that he does all the hauling free of charge.

them that were very much in my favor. My agreement usually is that I place the bees on the farm in question, and in return the owner gives me ground rent, and does all my hauling to and from the yards. This agreement makes it possible for me to operate all my yards with one outfit without either keeping or hiring horses.

Of course I give my landlords all the honey they need for family use, but in return they give me fruit and berries that equal and often exceed the price of the honey.

Cut No. 1 shows my Ballinger yard, located on the farm of David Ballinger. This farm has 138 acres planted with fruit and berries. Here is what Mr. Ballinger says:

The bees at my farm I consider a very necessary adjunct to fruit-growing. I grew last year 15 acres of strawberries; and although we had several frosts which killed quite a lot of bloom, and also fruit that was set, we had a fair crop, for which I give the bees the credit, as they helped to fertilize the later bloom, which, of course, was weak in that particular.

I also find the bees valuable for helping to get a set of fruit on my apple and peach orchards, as oftentimes we have either too much wind or some days none at all.

My crops of fruit and also strawberries have been larger, and also more regular, since keeping more bees.

Cut No. 2 represents my Lippincott yard, located on the farm of J. Howard Lippincott, which contains 120 acres planted with

apples, peaches, and berries. I was unable to get a written statement from Mr. Lippincott, but the fact that the apiary is there should be sufficient proof that he considers them valuable.

I have only one yard that is not located on a fruit-farm. That is my Campbell yard, located on the farms of the Campbell Soup Co. They grow vegetables and berries, also cucumbers, both in the open and under glass. Mr. H. F. Hall, their general manager, who is also president of the Vegetable-growers' Association, says:

The service of the honeybee is of the utmost importance in growing cucumbers under glass; as, without their aid, it would be necessary to hand-pollinate every female flower in order to obtain a crop. This would result in higher prices, due to the extra labor required, as well as to the fact that a lighter yield with a smaller percentage of high-grade fruit has always resulted when hand pollinating is substituted for the work of our little friends the honeybees.

The bees adapt themselves very readily to the greenhouse environment, provided the hive is not kept at too high a temperature. During warm weather it is advisable to place the hive outside the house, and provide an opening through the wall or glass.

I think that beekeepers who are located near fruit-growers can hasten the time spoken of by the editor if they will arm themselves with expert testimony, go to the fruit-men, and have a heart-to-heart talk.

Moorestown, N. J.



Another of Mr. Donaldson's apiaries, located in the Lippincott orchard, consisting of 120 acres of apples, peaches, and berries.

COLOR SENSE OF THE BEE

A Lecture by Dr. Carl Mulsow, Munich. Published in the Muenchner Bienenzeitung. Translated by J. A. Heberle, B. S., Markt Oberdorf, Bavaria, Germany.

[The average American reader is apt to skip over scientific articles, especially those which are not illustrated. In other words, we read what can be read quickly, and often put off the long discussions for another time—another time which too often never comes. The following list of experiments, proving that bees are not color blind, is interesting and valuable, and we feel sure that those who pass it by will be the losers.—Ed.]

The relation between flowers and insects has long been one of the most favored and interesting chapters of biology. The naturalist Christian Konrad Sprengel was the first one who, at the end of the 18th century, showed by many experiments that flowers do not, without compensation, give their sweet treasure (the nectar) to the visiting insects. He demonstrated that the flowers were dependent on the visits of the insects. He showed various forms and devices of the blossoms that insured the necessary pollination by the nectar-gathering insects. The flowers secrete nectar, not as a generous gift for the benefit of the insects, but for the selfish purpose of being pollinated to propagate the species. Sprengel was also of the opinion that the various bright colors and the sweet scent of the flowers were for the purpose of attracting the insects. To facilitate the finding of the nectar in the depths of the blossoms there are often conspicuous markings and patches at the base of the petals—signs to show the insects the way—to lead them to the nectaries.

After Sprengel other naturalists continued the study of these interesting observations,

and added numerous new facts. Most naturalists accepted the theory that the bright colors of flowers are for the purpose of attracting the insects. Some scientists, however, opposed this theory, especially the French scientist Plateau, who endeavored to show by numerous experiments that the color is of no importance for the finding of the flowers by the insects. Other scientists who opposed Plateau's view devised new experiments to show that Sprengel's theory was well founded.

The entire controversy was opened again when the ophthalmologist Hess, who had made an extensive investigation about the color sense of various groups of animals, asserted that the insects, especially the bee, have no color sense—that she is color blind. To digress a little, a few words about what is meant by color blindness. The color-blind man can distinguish various colors from each other, but he does not see as the man with the normal eye; various colors he sees as only different shades of gray. He distinguishes the colors only after their brightness. Through long experience the color blind has learned from childhood that

his associates called this blue, that red, etc., so that in most cases he can tell the color of objects from its brightness. If, however, two colors that are of a decidedly different hue (shade) have the same brightness, then the color blind can no longer see a difference. So we may say the color blind has the ability of distinguishing various colors, but has no sense of color—he sees the colors not as such.

Hess came through his extended investigations to the conclusion that a sense of color is developed only by the higher order of vertebrate animals, and that the lower order from the fish downward are destitute of the sense of color. Hess used in many of his experiments the bee, and thereby was the controversy whether the bees or the insects were attracted by the flowers through their bright colors opened anew.

If, as Hess asserts, the bees are color-blind, how are the various experiments by which many scientists formerly showed that the bees were attracted and the sense of location assisted by the colors to be explained? The explanation is very easy. All these experiments showed merely that the bees can distinguish between various colors the same as the color-blind man, but are no proof that the bees have color sense. This is the new principle on which Hess (and perfectly correct) wants the question solved.

That is the theoretical part of the question. Now we will consider some selected experiments which have been recently made with a view of proving the color sense in bees. We will determine the value of these experiments after the new theory developed by Hess.

The zoologist v. Dobkiewicz made numerous experiments which, in their arrangements and results, often agreed with those of former investigators. For instance, on a clover-field that was visited by a great number of bees he put up conspicuous artificial flowers of a yellow color that were filled with honey. These flowers remained unnoticed by the bees for a long time. The bees when once started to work on a flower are not readily detracted. If, perchance, a bee alighted on one of these artificial flowers, or the experimenter put one on, such a bee returned to the new feeding-place as long as she found something there. She is guided by the sight because now she alights also on yellow artificial flowers which contain no honey.

In a similar way bees may be trained to visit colored disks. In a place in his garden over which the bees of one colony flew regularly, v. Dobkiewicz put up large disks that were covered with red, yellow, and

orange colored paper. These disks were not noticed by the bees. He put a plate with honey near these disks. This plate, with a few bees that had alighted on it, was set upon the yellow disk. The bees were now for days fed on the yellow-colored disk. One day the places of the colored disks were exchanged, but the honey remained on the yellow disk. The bees visited only the yellow disk—never the orange-colored one that had been put on the place that the yellow had occupied. Finally the disks were again placed as at first. The yellow disk was now without honey, but the red and orange colored disks received honey. The bees visited again the yellow disk, looking in vain for the accustomed honey, while the honey on the red and orange disks was not noticed. The bees had been trained to look for food on the yellow color.

The possibility of training bees to visit a certain color is shown very nicely by the following experiment also carried out by v. Dobkiewicz.

A square box was used having three sides of glass and the fourth one of cardboard. In the cardboard two openings were cut, one to the left side, the other on the right side. A comb of honey was put in the box. The bees had been trained in a former experiment to use an opening in a yellow box. On the cardboard side of this glass box a yellow disk was put next to the hole on the left side (the hole was kept open). The other hole on the right side was marked likewise, but a red disk was used, and the opening was closed. Inside both openings were marked just as on the outside. The bees, which had previously been trained to the yellow color, used for entrance and exit the yellow opening on the left. After some time the marking was exchanged, the red disk was put to the left and the yellow to the right opening. This change was made not only on the outside but on the inside also and both holes kept open. The bees were not confused; they used the yellow opening as before. After some time the marking was changed back as it was on the start of the experiment, but after a while the marking on the inside of the box was changed, the outside disks remaining unchanged—both holes kept open. The left opening on the *outside* was now marked yellow and on the inside red. The opening to the right was *outside* marked red, but on the inside yellow—both holes kept open. Again the bees used without hesitation the yellow opening on the left side for the entrance, and the right opening, which was *yellow on the inside* and red on the outside, was used as exit. We might say that their sense of location, or the entrance

and exit in this experiment, was governed entirely by the yellow color.

These experiments proved what older investigations had already shown—the bees were in fact locating (finding their way) by colors. But do these experiments prove that the bees possess the sense of color? No, the bees might be color blind and react just as they did. By these, as by older experiments, was proven only that the bees can distinguish some colors. Whether they see colors as such is a different question which may also be solved by experiments, as we shall see by the following investigations of the zoologist K. v. Frisch, Munich. He takes issue with the views of Hess regarding the color sense of animals. He has also made experiments with bees to disprove the view of Hess that the bees have no sense of color.

K. v. Frisch in arranging his experiments was guided by the following principle:

A color-blind eye sees the colors only as various shades of gray. It sees no colors—only colorless brightness of variable intensity (*farbloße Helligkeitswerte*).

Therefore to each color—for instance yellow—there must exist a certain shade of gray which a color-blind eye can not distinguish from yellow; both will appear of the same colorless brightness; both will have the same "*farbloßen Helligkeitswert*."

K. v. Frisch took 30 pieces of gray papers which showed all the various shades of gray from white to black. These papers, all of equal shape and size, were fastened on a table, not in the regular order of the shades of color, but at random. Among them were also placed two papers in shape and size as the others but of yellow color. On each paper a small dish was placed. Those on the gray papers were kept empty, while the two dishes on the yellow paper were filled with sugar syrup. As soon as the bees of a nearby colony discovered the syrup on the yellow paper they began to visit these two dishes in large numbers.

The bees were fed for two days on the yellow paper to train them to the yellow color. The places of all the papers were frequently changed so the bees might not learn to locate the syrup after the order in which the papers were arranged on the table (to eliminate as much as possible every thing for guidance except the color). The bees alighted always on the yellow paper without the least hesitation.

The two yellow papers and the dishes were taken away and two new yellow papers were put in other places. Two new dishes were put on these yellow papers. This was done so there would be no odor to attract or guide the bees. Now all the

dishes on the gray and yellow papers were filled with syrup.

From this experiment the following deduction was made: If the bees are color blind they will see the yellow only as a gray, and must mistake some one or more of the 30 gray shades for the yellow. The bees, however, made no such mistake; they visited only the two yellow papers and paid no attention* to the many syrup-dishes on the gray papers. In locating the syrups they were guided only by the yellow color.

After the syrup had been removed from the dishes on the gray papers and the bees fed for some time on the yellow, the dishes with the syrup were removed from the yellow and replaced with empty dishes, so that all the papers on the table contained only empty dishes. The bees visited the two dishes on the yellow papers in great numbers, searching in vain for syrup, but not a bee alighted on one of the gray papers.

In the preceding experiment it has been proven that the bees recognize the yellow paper not only by the colorless brightness but by the yellow color. K. v. Frisch showed further by experiments that the same results can be obtained for blue.

The following is a strong proof. After bees had been trained to blue the two blue papers were removed and two new blue papers were put on another place. All the 30 dishes on gray paper were filled with syrup; only the two dishes on the blue paper were left empty. The bees visited the empty dishes on the blue papers in great numbers, and searched industriously for syrup, while the dishes with the syrup on the gray papers were for a long time not noticed.

Against the preceding experiments the following objection might be raised. Although the shades of the 30 gray papers were so nicely graded that the human eye could barely distinguish the two nearest shades, perhaps the eye of the bee is so delicate for perceiving differences in color brightness that even if it sees no color it can readily distinguish the yellow and blue paper by its shade of brightness. If that were so, then the bees could be trained to one particular shade of gray. K. v. Frisch made the following experiments:

The bees were fed nine days exclusively on gray No. 15. After removing the syrup-dish from No. 15, and replacing it with an empty one, the bees were searching for the syrup on the various gray papers without any preference to No. 15. The objection to the experiments is therefore groundless.

With the above-recited experiments there has doubtless been proven that the bees

really see colors. Another question is whether the color sense is similar to ours—if not, in what way it differs. K. v. Frisch has tried to solve this problem too. After bees were trained to a certain color, he used besides the gray papers various other colored papers also, and found that the bees sometimes, besides the color they were trained to notice, would also take notice of similar colors. Since the investigation is not complete we will not detail them further. It is interesting to note that the bees could not be trained to pure red. They would mistake it for black and dark gray. That means that the bees can not see the red color as such.

The fact that the bees can't see red as such brings us back to the relation of insects and flowers. In former times when no one thought of making exact experiments about the color sense of bees, investigators had pointed out that blue and violet blossoms were preferred by the bees, and the pure red neglected. This is true only of pure

red. Purple and carmine red contain some blue, and are, as v. Frisch showed, recognized by the bees, but easily mistaken for blue.

The results of the experiments are in harmony with the colors of the flowers. With the exception of the poppies, whose size without the color is sufficient to attract the insects, there are hardly any pure-red flowers in our flora.

Many plants produce shining-red fruits, but these are intended for the birds, not the insects. It is of special interest that in some countries red blossoms are found quite abundantly, but by those plants that are pollinated by the humming-birds, not by insects.

The investigations of v. Frisch have doubtless proven that the bees have color sense. The old theory that the colors of flowers are designed to attract the insects, which has been opposed by Hess, has been successfully vindicated.

Markt Oberdorf, Bavaria, Germany.

REPORT OF KENTUCKY STATE BEEKEEPERS' CONVENTION

BY RICHARD PRIEST DIETZMAN

On Friday, January 9, 1914, of Farmers' Week, conducted under the auspices of the Agricultural College of the Kentucky State University, there was held a beekeepers' convention in one of the assembly rooms of the State Experimental Station. About fifty beekeepers were present when the convention was called to order at ten o'clock in the morning by Professor H. Garman of the State Experimental Station. He welcomed the beekeepers in a few well-chosen words, and introduced Mr. H. F. Hillenmeyer, of Lexington, Ky., who presented a very interesting paper on "Kentucky as a Beekeeping State." He was followed by Dr. J. H. Kastle, the director of the station, who had prepared a paper outlining the purposes of the meeting.

Professor C. W. Matthews, of the station, was introduced and read a very interesting paper on "Bees in Relation to Fruit-growing."

Dr. M. A. Aulick, of Bradford, Ky., was next introduced, and gave a most interesting talk on his methods of producing extracted honey. We understand that Dr. Aulick is one of the most successful beekeepers in the State, and that his extracted honey has always a ready market at the best prices. When he concluded his address, the points that he made were discussed on the floor by various people who were interested in the

subject, after which Mr. H. C. Clemons, of Boyd, Ky., delivered an address on "Wintering Bees," advocating the use of sealed covers. There seemed to be a number present in favor of the absorption cushion, and an animated debate took place, which brought the convention up to the adjourning hour for lunch.

After lunch, Professor Garman presented a paper on the "Prevention of Swarming." Mr. E. E. Barton, of Falmouth, gave a talk on sweet clover. Mrs. J. T. Marvis of the same town was unable to be present, but sent a paper on the same subject, which was read.

Mr. Clemons then delivered a second address in the absence of Mr. Jordan, of Morgan, Ky., on "The Importance of Good Queens in an Apiary."

The convention then proceeded to organize a State Beekeepers' Association. Dr. Aulick was elected President, Mr. Clemons Vice-president, and Professor Garman Secretary and Treasurer. The constitution was adopted, and plans were laid for a vigorous campaign for members.

A bill had been prepared to strengthen the law concerning foul-brood inspection, and it was next taken up and discussed, section by section, and unanimously approved as prepared, and each member present pledged himself to use his best endeavors



Benjamin Paine's apiary and orchard at Roswell, Idaho. Reprinted from the March 15th issue for 1907.

with the members of the Legislature from his district to secure the passage of this bill, after which the meeting adjourned.

It is hoped during the coming year a large number of beekeepers in the State will become members of the State Beekeepers'

Association, and that when we meet again next January during Farmers' Week we will have a strong, live, and compact organization, and a meeting that will be full of interest and instruction to all, from beginner to expert.

A LARGE FRUIT-GROWER WHO IS ALSO AN EXTENSIVE BEEKEEPER

BY BENJAMIN PAINE

[Remembering the picture of the apiary in an orchard which we published in our March 15th issue for 1907, we wrote Mr. Paine, asking him to tell something of his experience during the six years that have elapsed. It transpired, however, that he had moved from the former location to another one near by—but his article, which follows, gives the particulars. The engraving referred to is reproduced herewith.—Ed.]

Finding I could not combine farming with beekeeping without hiring a great deal of help (and that took all the profit), I sold the forty acres that I lived on, at the time the accompanying picture was taken, for \$205 an acre, and bought ten acres about a mile from the original home. I built a new home, and planned near it my bee-yard. I planted 98 cherry trees between the house and honey-house. They are from 10 to 12 feet high now, at 3 years old, and this year some had five gallons of cherries on them.

The bees, however, did not do as well, and for five years I kept getting less and less honey. After investigating this I found there were too many bees in my locality—1150 colonies in all in a circle of three miles around me, so I could see it was time for me to do something or lose out. I scattered my bees out in different yards from three to ten miles from home.

I had about 200 colonies last spring. They increased to 400 colonies, and I got \$600 worth of comb honey and 14,000 lbs. of extracted honey. I put about 12,000 pounds of this in five-pound paper bags, and I got 7 to 7½ cts. a pound for it. There is more and more call each year for honey put up in this way. I had orders for tons that I could not fill this year.

Seven to twelve years ago when I was nearly the only one that kept any amount of bees I could count on \$10.00 to the colony, spring count. Now since others have crowded in, if I get \$3.00 to \$4.00 a colony I do well. However, by spreading them out I did some better last year, although it takes more time and expense to care for them. My wife and I and my son tended them this year, so the expense was not very great. I have an extracting-wagon with power to run the extractor.

Idaho is a good bee country, but it is getting badly overstocked for profit to the beekeeper.

Roswell, Idaho.

[Mr. Paine has promised us a set of pictures of his portable power-extracting outfit. These will appear later in the season. —Ed.]

PRACTICAL QUESTIONS CONCERNING BEES KEPT PRIMARILY FOR FERTILIZING FRUIT-BLOSSOMS

FROM HERBERT MILES

What is the best apparatus for separating honey from the comb for use on a farm having from five to ten hives?

What is the best method of keeping the number of hives down to ten? Please understand, we have not time to practice any scientific methods of swarm prevention and processes of that sort, but we don't want to lose any swarms or weaken our present stands by too much swarming. What we want to do is build up permanent strong colonies that will produce the greatest quantity of fine honey each season for our own consumption and that of our friends and relatives.

The prime purpose for maintaining these bees is to fertilize our fruit trees, flowers, etc. We have 150 acres in the heart of Maryland, one-half under cultivation, the other half in woodlands.

There is no running stream very close to our bees, and the writer noticed a number of them drinking out of a cess-pool a considerable distance off in the field from the house, into which are drained the urinals, bath-room, and kitchen of the dwelling. I believe this is a dangerous proceeding, and one that is liable to carry infection not only to the bees but the people eating the honey. Of course, we have been told many times by scientists that water purifies itself after being exposed to the air and running a certain distance, and it would be difficult to cover the entire draining system from this cess-pool. The only other place for the bees to get water would be at the horse-trough or around the well-curb of the windmill. Can you suggest any easy and practicable arrangement to prevent the bees drinking at the cess-pool drain.

New York City.

[Under the circumstances we suggest that you keep all queens

clipped, clipping the two right wings even years and the two left wings odd years. This plan will automatically enable you to tell the age of the queens at any time.

Undoubtedly it would pay you to produce extracted honey, as the problem of swarm prevention in extracted-honey production is very small compared to the same one in comb-honey production. Use good shade boards if the hives are located out in the open, and make sure that there is plenty of ventilation, both at the entrance and under the cover in the hottest part of the hottest days. Use pieces of broken sections under the cover, one at each corner, to give a little ventilation at the top in the hottest weather. This will do much toward preventing swarming, but, of course, should be done away with entirely when the nights are cool.



The cover of the writing-pad sent out by the N. Y. State Beekeepers' Association. See Jan. 15th issue, p. 69.

Follow the shaken-swarm plan for preventing increase. This takes only a little time, and effectually prevents increase beyond a certain point, if you so desire.

For an extractor we would recommend a four-frame non-reversible. This would be as large as you would ever need for ten colonies, and would be a very inexpensive simple outfit.

Bees must have considerable water, but

they use it in brood-rearing, no water ever being mixed with honey. Bees seem to prefer water that is briny or salty. If you locate a half-barrel close to your bees, and see that it is kept well supplied with water, you will very seldom see them obtaining water any place else. Use cork chips, or wooden floats, so that the bees can take the water readily without danger of drowning. —Ed.]

BEES AND FRUIT IN ENGLAND

BY WM. J. WOOLLEY, JR.

I am a fruit-grower on a small scale. I rent five acres of land and "let off" half of it, as I employ no help except in the summer months, and I want only $2\frac{1}{2}$ acres. One acre is planted with established plum trees in full bearing. One acre I have had planted 12 months with young apple trees, and cropping in between with strawberries, narcissus, and other flowers, marrows, tomatoes, cauliflowers, etc., and the other half-acre is generally planted with potatoes, which do well there.

This last year (1913) the fruit crop in England was recorded in the trade papers as only one-fourth to one-half a crop on the average; yet in my holding, all the trees were loaded and some breaking down with the load of plums, with the exception of the Damsons, which bore only one-fourth of a crop. The trade papers mention three causes of the poor crop. 1. The fruit spurs on the trees were not well ripened, through the constant wet season of the year previous, and so were not able to carry their proper share of fruit.

2. The cold and wet period of 1913 when

the trees were in bloom so that the blossoms did not set properly.

3. The attacks of aphides, etc., which were very numerous through the season.

If those were the causes, why were my trees able to carry such a crop of plums? I had the same wet weather to contend with. My answer is, the thoroughness with which the bees fertilized the blossoms. On the few days they were able to work while the trees were in bloom, the weather being so changeable, the bees did not fly far away from home, and, in consequence, the trees nearest to the hives carried a grand crop of fruit. Only one mile from my apiary an extensive fruitgrower with every convenience and appliance confessed to me that the season with him was "rotten." He did not keep bees.

Do you not agree that every fruit-grower ought to keep bees? I believe that the bees would pay the grower in increase of fruit, even if he did not reap a good crop of honey as well. I find by experience that they pay me on an average \$5.00 in honey besides the good they do to the trees.

Evesham, England.

CONVERSATIONS WITH DOOLITTLE

Continued from page 90.

swarm, and then preventing after-swarming of the parent colony by placing it a foot or two away from where it originally stood, and in seven days, when the bees are flying freely, carrying it to a new stand, thus drawing most of the flying force in with the swarm, work will be resumed and continued in the supers without interruption, and the surplus be nearly as great as though no swarming had taken place. Contracting in this way throws the whole working force into the supers just at a critical time, and secures a crop of white honey that would otherwise have been frittered away by a continued effort at swarming, or used in the

rearing of bees that would have come upon the stage of action when about the only thing that they could do would be to consume much of the honey previously stored, and hang on the outside of the hive during the heat of late July and early August days. All know that *white* honey brings a higher price than does the dark honey gathered in the fall, while the latter, as a rule, is just as good for winter stores. The contracting of the brood-nest, when properly done, with an eye toward securing the greatest amount of the higher-priced honey, puts this white honey in the market and the cheaper grades in the hive for winter.

Heads of Grain from Different Fields

Is a Hungry Queen More Likely to be Accepted?

I have been much interested in your account of the smoke method of introducing. I have tried it a number of times the past season, and have failed but once, and that was in the case of a double hive. Afterward I noticed the partition between the two colonies had a crack large enough so the bees of the two hives could go back and forth. Whether this was the reason for the failure I do not know.

Do you think it would make any difference with the success of the method if the queen has fasted a few minutes before she is run in? There would be a few minutes when she would be without food if she were put into a cage alone, before we could get the colony in shape to run her in. Supposing the queen is received by mail with workers which would feed her, would she be as acceptable, in your opinion, as a queen that was a little hungry? No doubt you have had experience in this. I have not, as all the queens I have introduced by this method have been queens taken directly from my own hives.

Have you been as successful in running virgin queens into full strong colonies as you have with fertile queens?

Randolph, N. Y., Dec. 1. GEORGE SHIBER.

[Undoubtedly the leak between the two hives was the cause of the one failure that you report in the smoke method of introducing. A fasting queen, under ordinary conditions, will be more readily received by the bees than one that has been well fed. You will find the fasting method of introducing given in Samuel Simmins' book, "A Modern Bee-farm." A description of this same method will be found under the head of "Introducing," in our A B C and X Y Z of Bee Culture. Mr. Arthur C. Miller, however, the author of the smoke method of introducing, does not believe that it is necessary to go to the trouble to starve the queen before she is given to the bees. See his footnote regarding the fasting method as given in our A B C and X Y Z of Bee Culture.]

Ordinarily it is easier to introduce a laying queen than a virgin three or four days old to a full colony. But a virgin just hatched can be more readily introduced than a laying queen. But when the smoke method of introducing is used, it does not seem to make very much difference whether the queen be a virgin or a fertile one.—ED.]

The Smoke Method of Introducing Used for Years

It is several years since I adopted the method of introducing queens by running them in at the entrance with a little smoke. If the bees then kill the queen they would also kill her if she was introduced under the best caging method. F. A. HOOPER.

Four Paths, Clarendon, Jamaica, B. W. I.

[The smoke method of introducing, as applied by Mr. Henry Alley, is very old; but Mr. Arthur C. Miller's modification of the Alley plan, so far as we know, is comparatively new. You will find quite a difference between the Alley plan and the Miller method.—ED.]

Combs Built in Sections Between Shallow Extracting-Combs

In the Nov. 15th issue, p. 805, I read the article by J. E. Hand on getting bees to work readily in comb-honey supers when producing section honey. I have made some experiments along this line with frames such as are used in N supers. I fill these with sections, and the sections with full sheets of foundation; then place these in shallow extracting-supers, alternated with shallow extracting-combs, making sure that the outside frames of the super are combs. If these section frames are left a few days, as described, and just over the brood-nest, or in a

strong colony, and over an excluder, the foundation will be found nicely drawn out if there is a fairly good honey-flow.

These section frames, with sections of drawn combs, can then be removed, and placed in section-honey supers, with fences between them, and then placed on any hive, when the bees will proceed to work on them at once if there is honey coming in.

I think if Mr. Hand will try this method, instead of drawing out sheets of comb, and cutting up, placing in sections, etc., as he describes, he will find the labor has been cut one-half without loss in principle.

Shellman, Ga., Dec. 6.

D. W. HOWELL.

Should Winter Cases Project Below the Bottom-board?

I should like to know about using winter cases. I received one, and in putting it over the hive and leaving it an inch higher than the top of the hive it does not protect the lower part of the hive. Is it to be used that way, or should it go away down over the bottom-board and all, and an entrance cut in front?

CHARLES L. SOMMER.

North Tonawanda, N. Y., Dec. 3.

[We do not know what style of winter case you refer to; but the ordinary outside winter case that slips down over a hive will not cover the bottom-board and the entrance. The point of protection should be applied to the top part of the hive. If you are using a winter case that telescopes over the general body of the hive, it is usually advisable to remove the regular hive-cover, put on a super-cover, and then place on top several folds of newspapers, old carpeting, burlap sacks, or any kind of packing that will make a space of $1\frac{1}{2}$ or 2 inches over the top of the hive and around the sides. When these are carefully tucked down, the winter case is shoved over the whole, making a nice warm enclosure over the hive on the inside. The outside cover of the hive is then put over the winter case for the winter, or it can be taken inside of a building if necessary.—ED.]

Hundreds of Acres of Sweet Clover Sown for Pasture

In the Dec. 1st issue, p. 869, I have read the article by L. R. Witherell in regard to sweet clover. This clearly proves that he is either ignorant or prejudiced as to its good qualities. For 20 years I have been advocating it as an all-round better plant than alfalfa. I can show Mr. Witherell hundreds of acres sown to sweet clover for pasture, and more being sown every year. There is nothing as good as sweet clover for enriching poor land.

Salix, Iowa, Dec. 12.

LEWIS LAMKIN.

Prospects Good in Jamaica

May be GLEANINGS readers will be interested to hear what the bees are doing in Jamaica. We are enjoying the finest November weather we've had for many years, making ideal conditions for the bees. It is sunshine and showers, not two days together when the sun has not shone. The bees are working on Christmas pops (bell-flowers) and a profusion of minor bloom, many strong colonies storing well in supers, and the weakest getting enough honey to keep up brood-rearing. So favorable has been the fall weather that no drones were destroyed by the bees, so queen-rearing has gone on uninterruptedly, and fine full-sized queens raised.

Most apiarists have not had to feed an ounce of sugar; but, instead, have obtained a tidy surplus. This season is in marked contrast to that of 1912, when such wholesale losses were sustained by the flood-rains, and the crop was so much shortened.

With the bees at their present strength, or stronger when logwood opens next month, it is reasonable to expect a bumper crop and a big increase in bees to make good the losses of the past season.

The cool balmy air, soft yet bright sunshine, together with the healthy hum of the bees over myriads of wild flowers, all go to make one feel that it is good to be alive in this land of perpetual summer.

ARTHUR W. ROGERS.

Belvedere, Jamaica, Nov. 26.

Number of Colonies Needed per Acre in a Fruit Orchard

My brother and myself have about 200 acres of orchards of various fruits, and are interested in having plenty of bees to pollinize the fruit properly. There is an apiary about three-fourths of a mile east of me, and another about the same distance west, and a party in Toledo wishes to establish another on my place. I do not care to take on another business myself, but want as many bees in the vicinity as will thrive properly. Can you give me any data that will help me to decide how many that is?

Waterville, O., Dec. 22. W. W. FARNSWORTH.

[So far as we know there is no exact scientific data to determine the number of bees necessary for a given acreage of fruit trees; but we may say this, that more bees are needed in some seasons than others. For example, there may be a number of days while the trees are in bloom when it is cold, chilly, or rainy, so much so that bees can not fly. If there is only one or two flying days during the entire blooming time, obviously it will take more bees to pollinate the trees in a given acreage than if the weather is favorable for a week or ten days. On this account, therefore, it is desirable to have as many bees as you can get on the place or near it.

There is a forty-acre apple orchard about nine miles and a half north of Medina that was leased last year by Van Rensselaer & Southam. The former is an old experienced fruit-man, and he began pruning the trees, as the orchard had been neglected. He got in touch with us very shortly, and desired us to put as many bees in and near the orchard as we could spare. While there were quite a number of small apiaries in the locality, he wanted a yard of bees right in the orchard. We put in some fifty colonies of bees, and at the time he said he would be glad to have more if we could spare them, but as we had similar calls from other fruit-growers we were unable to supply them with any more bees. At the close of the season they harvested 16,000 bushels of apples from the 40 acres, and Mr. Van Rensselaer told the writer that he would not have secured as large a crop as this had the bees not been placed right in the orchard. He is a great believer in having plenty of bees close to the trees. See his article in this issue, p. 94.

To answer your question a little more specifically, we should guess that about one colony would be required to take care of an acre of fruit trees, but two or three colonies would do much better work if the weather is at all bad during the time the trees are in bloom.

We are convinced that the fruit-growers have not half appreciated the importance of having plenty of bees on the place. We are sending you a copy of our journal, GLEANINGS IN BEE CULTURE, for Aug. 15, and refer you to page 561 for the testimony of the Repp Bros. regarding the value of bees in an orchard. You will find further particulars in an article about these men in the *Country Gentleman* for May 24. While you are doubtless familiar with their fruit-growing operations, we suggest that you write to them, and ask how many bees they consider it necessary to have per acre.

There is another fact that might be somewhat interesting to you, and that is this: Last summer we visited the logs of the Cape Cod Cranberry Company,

of Boston, Mass. The president of this company was very desirous that we should come and visit his place, which we did. He had discovered that, when they were growing cranberries in a very small way, the bees in the woods were sufficient to take care of the work of pollinating the plants, but when they began to increase their acreages of cranberries, then something was wrong, and they were not able to get the berries. He finally discovered that, by putting bees around the bogs, he was able to get the usual crop. He showed one bog of some ten or fifteen acres that had only about four or five colonies of bees. It was very evident, he said, that the fruit was much more abundant near the bees, and the yield began to taper off the further the plants were from the hives of bees, showing that the bees went to the nearest blossoms first. In other words there were not nearly enough bees to take care of the entire bog. We should judge from what we saw there that it would take anywhere from ten to fifteen colonies, or about a colony to the acre of cranberries.

For your two hundred acres there, it would seem as if you ought not to have less than 200 colonies, and we might suggest that it would be better to have these scattered over the orchard. You will be surprised in the increase in the amount of fruit if you will increase the number of bees. We have seen so many examples of remarkable results from such work that we wish to suggest that you get as many bees on the place as possible.—ED.]

Bee Space on Both Sides of Ventilated Escape-board

On page 887, Dec. 15, is a photo of Hodgson's escape-board. I made two Labor Day to try out. They are all right. I want no others, but I made them of copper wire, put the escapes with opening toward the outside, and had a bee-space on *top* of the wire as well as *under* it. I made the bottom piece 1½ inches wide, ½ thick; the top piece 1 x ½ inches, and put the wire between. This makes a much stronger and better job—no brace combs. The bees go out much quicker than in the wooden ones.

Lestershire, N. Y., Dec. 29. JOHN H. RISING.

[We believe Mr. Hodgson also uses a bee-space on both sides of the wire cloth. Those which we have made in an experimental way were so constructed—viz., with a ¾-inch cleat above and below the wire.—ED.]

Winter Disturbance

We have been thinking of storing our bees in a shed where an auto is kept. Do you think the fumes from a running car would be injurious to the bees? The car will be running from time to time.

Norris, Mont., Dec. 1.

HADZOR BROS.

[We do not believe that the going and coming of the automobile will interfere with the wintering of the bees. They will soon get used to it, so that, if it should arouse them the first time slightly, they will pay no attention to it later. We presume the shed is opened up in such a way that the bees would be protected from the prevailing winds.—ED.]

An Explanation

There is one item in the article by H. H. Root in the Dec. 1st issue that I do not want to leave as it is, and that is the statement of our honey crop for 1913. It was my intention that in connection with that report should go my statement that I knew of seasons when I never wet the extractor at all, or during the season did not wet it with white honey. I have blamed others, and justly, for giving one-sided reports, and I do not want to be an example in this direction myself.

Brantford, Ont.,

R. F. HOLTERMANN.

Our Homes

A. I. Root

Thou shalt love thy neighbor as thyself.—MATT. 22:39.

Oh how I love thy law!—PSALM 119:97.

This is the condemnation, that light is come into the world, and men loved darkness rather than light, because their deeds were evil.—JOHN 3:19.

I have lately been having some business experiences that tempted me to think that a great part of the world (but not *all* the world, thank God) have just now a sort of craze to raise prices on every thing. Sometimes I have been tempted to think they tuck on a bigger price when I come around, because they have got it into their heads that I have plenty of money and am so good-natured that I would not make a kick any way; and as I got to studying over the matter—yes, this very morning—I said mentally, "Oh how I love good honest people—people who *really* love their neighbors *almost* as well as themselves!" I did not put it as it is in the text, "as thyself," for I feared that *that* would be expecting too much of any of us, good or bad; and then I reflected that if there were not any greedy or grafting people in this world we would not fully appreciate the honest ones. Yes, thank God, there *are* people (and quite a lot of them) who do not charge as much as they really ought to. I have in mind one good friend who is a sort of drayman who delivers goods from the railway station and otherwise. Several times I have laughingly told him that he did not charge *enough* for his bother and trouble. Now, this man has lately united with the church, and he began putting his Christianity into practice by just this sort of thing—working so cheaply that many times his customers laughingly remonstrated with him. Perhaps the dear old soul will see what I am writing on these pages. Well, while this whole thing was passing in my mind I thought of David's speech or *prayer*, or we might almost call it a prayer, "Oh how I love thy law!"

Dear friends, I am having a lot of kind words. I think they come every day of my life, and sometimes they seem so extravagant that I hesitate to put them in print. Right before me is a letter that caps them all, and it comes from a man away up in public service. He is president and general manager of an electric railway company in a city of something like 30,000 people. You will note his reasons for having his name and address kept out of print. His reasons, briefly summed up, seem to be that he is already having about as much trouble in his efforts to encourage righteousness as he can well bear; and if I should give his name

in full, and tell *where* he lives, he might have more trouble yet.

His request for a French bee-journal has been complied with; and may the Holy Spirit be with him and sustain him in his battle for the right, and may God be praised for the victories that have already come in consequence of the brave stand out from one single individual with heavy responsibilities on his shoulders. Will the readers of GLEANINGS unite with me in a prayer for the writer of the letter below?

I wonder how many large cities in this nation are being managed as outlined below.

The A. I. Root Company:—I read French, and would appreciate it very much if you could send me a copy, even if it is an old one, of a French bee paper corresponding as nearly as possible to GLEANINGS. You must have a number of these among your exchanges. If I like such a paper, I am considering subscribing for it.

I am also enclosing a little expression of appreciation of Mr. A. I. Root, which, perhaps, you would like to print for your own good. If you do, however, please leave out any reference to the city mentioned or the author, as I am not looking for any more trouble than I already have.

AN APPRECIATION.

For the last six years I have been reading GLEANINGS, and I appreciate it more every year. Because I happen to be the head of a public-service company which, like all other companies in the same line of business, seems to be continually embroiled in strife and trouble with politicians, I could not understand how it could be possible for any business to exist where there seemed to be peace and happiness and a spirit of Christianlike tolerance and forbearance. Why, in the bee business even rival bee-papers speak kindly of each other—a condition which is entirely too good to be true. And then all of the bee-papers interpolate their reading-matter with the real spirit of Christianity, and with talks on temperance and kindred subjects. I am afraid that at first I read GLEANINGS mainly out of astonishment and curiosity. I have kept bees in a small way, and have gotten a little honey every year; but I have a greater satisfaction than the amount of honey I get in the knowledge that I am engaged in a pursuit which seems to be entirely free from petty jealousies and personal strife. I have particularly enjoyed Mr. A. I. Root's temperance talks—not that I am a teetotaler, for I was born and brought up in a wine-growing country of Europe, and I have a sort of sympathy for the product of the grape; but I admit that every single thing that Mr. Root says about intemperance, whisky, and the whisky gang is absolutely true. Placed in such a position as mine, with hundreds of men in my employ, I know the evil of intemperance among workmen. Several years ago, about the time I first took GLEANINGS, I issued an order forbidding all employees to enter saloons or to take any intoxicating liquors; and I am inclined to credit Mr. A. I. Root's talks with stiffening my backbone for the purpose. We had to lose some good employes before they realized I meant it; but others took their place, and by strictly enforcing this rule we to-day have an organization of employes in our electric railway, electric light, and other public service, which is probably better emancipated from the curse of intemperance than any other similar organ-

ization in the country. The saloon element rose up in arms against such an order by boycotting my company. They boycotted the cars, would not use electric light, would not have any dealings with the company unless they were absolutely compelled to. But we stuck to the order, and have prospered in spite of the opposition of the saloon element. This same saloon organization controls the politics of our city, and they elect their own mayor, sworn to enforce the laws, and he enforces them so well that saloons are open day and night, Sundays, holidays, election days, or any other day. On any pleasant Sunday or holiday, citizens may have the pleasure of seeing "His Honor" (?) seated at a round table in the back room of some saloon, guzzling beer with his boon companions. You may rest assured that that kind of mayor has used every effort in his power to annoy a public-service company, so utterly regardless of the ordinary amenities of politics as to dare oppose the gang in power—the gang in this case being the saloon men. Naturally there has been a time in this city about as cheerful and entertaining as the proverbial Donnybrook Fair. The brewers, the saloon men, and their friends are a crafty lot of individuals. Few people realize the enormous power of the liquor element in politics. If they did, the whole gang would be wiped out in one election. Some very level-headed thinkers have been of the opinion that much of the hue and cry against public-service corporations has been skillfully engineered by the liquor interests to draw attention away from the ulcer of their own existence. In the midst of this turmoil, and the mud of political campaigns involving saloon men, it is and has been a pleasure to receive GLEANINGS twice a month, and go through its pages reading of the clean, honest business conducted in a clean and honest way, and capped by the kind observations and comments of your Mr. A. I. Root.

FROM NEAR "THE LAND OF THE MIDNIGHT SUN;" A VERY KIND LETTER FROM A NORWEGIAN SCHOOLTEACHER.

Dear old Friend:—Of course you have long since forgotten me; but I often think of you, especially among my bees, and every time when GLEANINGS flies into my house; also among my poultry I think of you.

Since you are in my eyes an old brotherly friend, whom I should so like to see, I will make bold to ask you a favor. Many of our newspapers speak of a new plant as an exceeding blessing to manhood, going to supplant the potato. They call it dasheen. I. S. Young told me of you. He is dead now. Now, I should like you to send me a little seed, and at the same time tell me how it is planted, and when and how it is treated, and when it is ripe. The newspapers say not only the root is excellent, but also the leaves, stewed like salad. Both also are good for cattle. Are the roots cooked or fried? or both, like the potato? The bags you put it in must be strong, so that the seeds may by no means be mixed up.

You know schoolmasters don't earn much, and I have eight children to educate, so my little part of Norway (exceedingly picturesque) costs me only 280 English shillings (\$70.00), and consists of wood, mountain precipices, debris, and oak roots; but now I have cleared it myself, with the assistance of my wife and children, and have two fruit trees and ever so many bushes and a kitchen garden. If what these three American plants or grasses promise holds good I might also easily have a cow (or even two), which would be a grand thing.

My three oldest sons go in for the agricultural line, so you see what way my interests go along with teaching children, which is by far the most beautiful and blessed calling of all in life.

My oldest son is just now with two empty hands, but a life and heart full of good will; and after having passed his agricultural examinations with the very greatest distinction, he bought a farm of his own; and if now these American plants hold good, you know what a blessing it would be to him as well, if I give him part of what you send me. Of course, I shall pay your outlay. His farm cost 24,000 English shillings (\$6000), and he has but 3000. Fancy, then, how the poor fellow will have to work.

Perhaps you think, like others, that Norway is a country high up under the pole, with "ice bears" in the streets. Well, if you do, to undeceive you I will tell you that here in the South our gardens are as full of the most splendid apples, pears, plums, etc., as ever you saw, and myself and another man here get ripe grapes and peaches and apricots every year on free land; therefore I don't think you need fear your seed would not thrive. To-day, Sept. 12, we have 73 degrees Fahr. in the shade (no sun in the sky to-day, otherwise it would be still warmer), and the water in the "fjord" (bay) is 72 Fahr. It would give your heart joy to see how happily and tidily people live in their little houses, and how the weest spot of ground among the mountains and rocks, by means of stone walls, is made into a garden with fruit-trees and flowers, often no bigger than 5, 6, or 8 feet square, and even less than that. Indeed, so rocky is this part of my glorious fatherland that there is not a single garden about the town but is now, by means of stone walls, built up 15 feet high to get a patch of garden no bigger than the floor of your own dining-room. You never saw the like; but if you once have such a little spot, whatever you plant grows most beautifully, and the steep mountains around absorb every ray of the sun and make it very warm, day and night; and as the nights are very light even here in the south you can, if you will strain your eyes, read your newspapers at twelve and one o'clock at night in your garden about the middle and end of June. The plants grow day and night as well. Such a country, with so much stone and so little earth, must needs be poor; but as the nation is enlightened and gifted and pious and striving, you never see extreme poverty as you see in the rich countries.

I do believe the word of God thrives nowhere so well as in the valleys of Norway, and perhaps you will think I speak right when I tell you of our missions among the heathen. We carry on missions in Zululand, Madagascar, Santhastan, China, besides among the Jews, and a minor mission in our own country. Well, the statistics some 20 years ago (and I feel sure it is the same yet) said that Norway alone (2½ millions of inhabitants) gave as much to the mission as Sweden (5½ millions of inhabitants) and Denmark (2½ millions), and half of Finland (2½ millions of inhabitants), put together. May I not be proud of such a fatherland, for Sweden and Denmark, at least, are ever so much richer countries than Norway. Norway is, perhaps, the most democratic country of Europe. Indeed, since 1827, nobility and gentry are forbidden by law. We are Lutherans; and in all the country there are but a hundred Jews or so, and but 1100 Roman Catholics, which is a most happy state of affairs.

Formerly our people were very much given to drink; but during the last thirty or forty years the nation has made such violent efforts against this unhappy habit that there is now but one country in Europe that consumes less spirits—viz., Finland. I am more than happy to say that, like their father, my three grown-up sons (28, 27, and 19 years) have not been under the influence of wine a single time in their life, which is much; for when young fellows come together in Norway their first thought is whisky. I think it is all owing to a tale out of my own brave, unselfish father's life. He distinguished himself so much serving as a soldier that two lieutenants and one captain in the army offered to send him to

the military high school some years and make a lieutenant of him. He was as poor as a church mouse, and would have been ever so happy to accept this grand offer; but he was engaged to my sweet mother; and because he was the man he was, he saw a chance to marry pretty soon, and said "no," much to his regret afterward, when we children came. Well, one of these lieutenants had confided to him a most exceedingly important key. What should happen? My father attended a party and got intoxicated; and, going home in the pitch-dark night, heard the key falling down somewhere as he pulled out his pocket-handkerchief. He lay down in the greatest anxiety, groping for the key, when a man came that way—the very lieutenant who had given him the key, and would have paid for him for years. He lighted a match and helped father, who felt nearly sober from fear and despair. Of course, father expected to be scolded and arrested, and was miserable for days. But the lieutenant (God bless him for his heart and deep understanding of his fellow-man) gave him back the key and never uttered one word of anger or reproach. My father then swore a holy oath. "It was and is to be the first and last time in my life," and he kept his word till he died, 72 years old, as an "over custom-house officer," as we call it, in the king's service. This tale and his long life of sacrifice for his children (we were eight—i. e., seven sisters and a boy) made such an impression on me, his only boy, that already, 14 years old, it was as clear as day on my mind that I could not live through the day when my father should be compelled to lower his eyes before the world for the sake of his boy. And as my father kept his promise holy, I have kept mine. And now my three boys have stood out brave after us two, although they have been tempted enough. I have not been able to give them pocket money worth speaking of. Well, at a party some young fellows, some 20 and 22 years old, laid 12 English shillings on the table to my boy if he would drink a glass of pure whisky. He did not touch it.

Bees are doing well this year. In my district we have the weather to rely on. Once I put my hives on the scales every day a week. My best colony once carried in 8 pounds.

My parents allowed me to keep hens, as I was but seven years old, and I have gone on with them since then. I thank my prudent parents in their graves; for, thanks to this intense love of animals, which sprang up then (I have or have had hens, geese, turkeys, ducks, canaries (hatched them), sheep, goats, doves, rabbits, peacocks, swine, and even once for some weeks a horse). I have been sticking to my home and poultry-yard and garden every leisure hour of my life. You should see me and my boys mining, shooting, and building terraces in the rocks every spare hour, and digging and manuring the garden. Well, the trees are yet small, but yet every inch of the floor of a middle-sized room is to-day, Sept. 22, covered with apples, and the pears are yet on the trees. There are joys and blessings in the footsteps of work.

I believe mostly in hens and geese, and wish I could afford to buy a reliable incubator that would hatch these two sorts of eggs; but I can not nor dare buy one for fear it might be a failure. I once made bold to buy a machine for grinding or cutting bones for my poultry; but it was quite an impossible thing, and I had to throw it away as rubbish. Incubating under hens is all right, but it can not come to much, which is a pity for a man without neighbors, and with a place where chickens of all sorts may roam about as much as ever they like. There is a rivulet going through to a little pond in my garden.

If I get a photo of "Min lill vea imellanbergen" (my little nook among the rocks), as it runs in a most beautiful Swedish song, I shall have pleasure

in sending you one. Perhaps you will shudder to see people building their houses like birds' nests among the precipitous rocks; but we live happily there, I assure you, and our animals with us; and such beautiful views, your heart would leap with joy to see them, and you would fold your hands in prayers and thanks to the great Lord who made this grand earth. You should see the lovely farm my boy has bought, and will now try to hold good with his two empty hands. A workman in Norway lives more beautifully than a prince in foreign countries as regards the view. I am now trying to get him some calves and one cow, for he has ever so much hay, poor boy, and not a single cow. Now you are tired of me long ago; but you see you talk to me in every GLEANINGS, and I never speak to you. My motto has been all through life, "All or nothing," a whole man in every thing, or, as a Norwegian saying runs, "Not det skal vere jul, skal det vere jul," i. e., when it is to be Christmas, then it is to be Christmas—i. e., nothing by halves. I shall wait ever so long, perhaps, before I write to you again; but if I do write, I will send you only two lines. If you send the seed I shall have to thank you in my own name and that of my noble boy who is fighting his battle like a man. It is hard at times; but upon the whole I know for certain, for I have seen much of the world—one year at Oxford, on year at Paris, and two years and a half as a teacher in a German grammar school near Dresden, Saxony, living in such a poor country. If my boy could get 2000 shillings he could buy a magnificent island covered with plenty of wood and with excellent pasture, only 15 minutes from his home—an island which it took me fully an hour to row around in a boat this summer; so you see land may be cheap in Norway, and a man may have his chances even here; but what is the use of it when money is so scarce!

HAROLD HOVIND, M. A.,
of the University of Christiania, Head Master
of the High School of Tvedestrand.
Tvedestrand, Norway, Sept. 15.

Our readers will notice that we print the above letter substantially as it came. Our good friend's phraseology, coupled with his many kind words, makes it seem almost as if we were visiting in and around his northern home. If I were not so well along in years I should be tempted to take a trip to Norway. It seems he was a friend and acquaintance of the late Ivar S. Young, the big Norwegian who paid us such a friendly visit many years ago.

My good friend, I can not understand why your bone-cutter was a failure unless it is because it is too hard work to grind bones.

I would not advise you to undertake to hatch hen eggs and goose eggs at the same time together. Although it has been done, there are several reasons why it does not pay. The manufacturers of our best incubators do not recommend it.

If I am correct, your locality is one of the best spots on earth to see real high-pressure gardening. May God speed you, not only in agriculture, but in temperance, righteousness, and in spreading the gospel

High-pressure Gardening

PRODUCER AND CONSUMER — SAVING YOUR OWN SEED.

Just about a year ago I wrote about my troubles in getting seed of sweet corn to plant here in Florida in December. Before I could get any I sent to three different seed-houses. The first, after considerable delay, said they hadn't yet got in their seed; the second didn't list the corn (Golden Bantam) I particularly wanted; and finally I sent to one of the great seed firms in the North, and had my order promptly filled; but although the Bantam came up, almost every seed of the Black Mexican, in a row close by, gave only here and there a plant. I advised the seed firm to look after their Black Mexican, and test before time to plant in the North. Never a word in reply; but several of our readers called my attention (as you may remember) to the fact that the Bantam, not being a sweet corn, is more resistant to cold, etc. I accepted this explanation, but yet I did not quite excuse the seed firm for entirely ignoring my courteous letter. I finally succeeded in growing a fine lot of green corn. *The neighbors* said that it was the best they ever ate; but on account of delays I have mentioned, it matured just *after we* went North, about April 20.

Now we are ready for what I have to tell you. When our nice sweet corn was at its best in Ohio (that I have told you about) I tied strips of cloth to certain stalks to be reserved for seed; and when the ears were finally mature I dried them out back of the stove, and brought three kinds down here—Bantam, Mexican, and Evergreen, planting all three side by side in November. All three came up, every kernel, apparently Black Mexican just as well as the Bantam. How much is it worth, friends, to have *good seed* that you *know* will grow? Let us go a little further.

For some time past I have got into the habit of using more seed than is needed, proposing to "thin out" the plants at the proper time; but there are *three* serious objections to this plan: It takes a lot of time; it is often neglected; and, besides, the small plants are hindered by coming up too thick. Down here we plant in drills because the fertilizer can be worked in so much better with a hand cultivator. Well, with my own good seed I placed just one grain of corn to about every foot of drill; and as I look out of the windows while I write I see my corn about a foot high, no crowding, and no *missing hills*; and it is so easy to hoe and

cultivate that not a weed can be found. Don't you think that "growing your own seed" will be another "short cut" between "producer and consumer," and a great saving of loss and disappointment? The manager of the great onion-farms in Ohio declare they *must* grow their own onion seed. They get far *better* seed, and seed they *know* will grow.

DASHEEN—WHERE CAN THE SEED BE PURCHASED FOR PLANTING, ETC.?

So many are inquiring, I have thought best to copy, by way of answer, the advertisements below, taken from the *Florida Weekly Grower* (Tampa, Fla., \$1.50 per year).

TRINIDAD DASHEEN.—Edible, wonderful yield. Very decorative. Send 25 cts. for sample tuber and directions. DR. H. A. SMITH, Samville, Fla.

DASHEEN FOR SEED FOR SALE.—\$4.00 per bu.; quick delivery; choice stock.

MRS. R. P. BURTON,
800 So. Willow Ave., Tampa, Fla.

THE DASHEEN.—The South's substitute for the Irish potato. Very productive. Have yields up to 500 bushels per acre. Successfully grown from the Carolinas south. Plant here beginning February 1, and until April further north; seven months to mature. Cultural directions sent with seed; cooking directions with cooking tubers. Seed \$4.00 per bushel, f. o. b. Write for prices on five-bushel lots or over. Cooking tubers, \$2.00 per bushel f. o. b. (Reference, *The Grower*.)

THOS. PORTEUS & SONS,
Rt. 3, box 126, Ybor City, Fla.

Besides the above, Crenshaw Bros. Seed Co., Tampa, in their new seed catalog advertise "1 lb., 25 cts.; per bushel, \$1.00." Of course, the above are all small tubers for planting except where noted. The big "corms for cooking" are cheaper. From Brooksville I have an offer as below:

DASHEEN SEED.—\$3.00 per bushel; \$2.50 in five-bushel lots or over. GEO. KITCHEN, Brooksville, Fla.

DASHEEN TUBERS FOR PLANTING OR FOR TABLE USE.

Two of my neighbors, Mr. Ault and Mr. Harrison, have a limited amount of dasheen which they grew from seed I furnished, which they offer as follows: Single pound, 10 cts.; 10 lbs., 80 cts.; 25 lbs. (½ bushel), \$1.75. The above are for small tubers for planting; larger ones for table use, one-half above prices. Your postmaster can tell you how much to send in addition to the above for postage if wanted by parcel post. Address Arthur E. Ault or C. L. Harrison, Bradentown, Fla.

BUYING LAND IN FLORIDA; SOME "BOILED DOWN" COMMON SENSE IN THE MATTER.

I clip the following from the *Times-Union*:

Don't buy land till you have actually seen it in person, and made the acquaintance of a few people (in the vicinity) who have no land for sale.

I have two swarms of bees, and took off 250 lbs. last season.

Grand Haven, Mich., Jan. 15. I. N. TUBBS.



Ellis Hall, Athens, Ohio, where the Ohio convention is held. See program below.

Convention Notices

The regular meeting of the Kansas State Beekeepers' Association will be held at the Commercial Club Rooms, Topeka, Feb. 26, 27. All persons, whether beekeepers or not, are cordially invited to attend. The meetings will close with a banquet on the afternoon of the 27th.

Topeka, Kan., Jan. 20. O. A. KEENE, Sec.

The annual meeting of the Pennsylvania State Beekeepers' Association will be held in the Capitol building, Harrisburg, Pa., Feb. 20, 21, 1914. It was decided to hold the meeting in Harrisburg on account of train service, and the city being more centrally located. A good program is prepared. Everybody welcome.

Liverpool, Pa., Jan. 20. H. C. KLINGER, Sec.

A district beekeepers' convention will be held in the county council building, London, Ont., Feb. 12 and 13, with the following program:

THURSDAY.

1:30 P. M.—The use of steam in the workshop, Denis Nolan. Wintering Bees, James Armstrong, Cheapside.

7:30 P. M.—Marketing honey, Prof. Pettit, O. A. C., Guelph. Spring Management, John Lunn, Fingal.

FRIDAY.

9:30 A. M.—Extracted-honey production, R. F. Holtermann, Brantford. Queen-rearing, Wm. Elliott, Adelaide.

1:30 P. M.—Beekeeping Appliances, W. A. Chrysler, Chatham. Question-drawer, John Newton, Thamesford.

A cordial invitation is extended to every one to come and make this a good convention.

Lambeth, Ont., Jan. 20. E. T. BAINARD.

PROGRAM OF THE OHIO BEEKEEPERS' CONVENTION TO BE HELD IN ELLIS HALL, OHIO UNIVERSITY, ATHENS, FEBRUARY 12, 13.

THURSDAY, 1:00 P. M.

Address of welcome, Dr. Alston Ellis, President of Ohio University. President's address. Report of secretary. Report of Treasurer. Report of Chief Inspector of Apiaries. "Swarm Control," O. J. Jones, Urbana. "The Swarming Instinct," E. R. King, Creola. "Soft-candy Feed," Dr. Burton N. Gates, Amherst, Mass.

THURSDAY, 7:30 P. M.

Music. "Short Cuts in Preparing for the Honey-flow," H. H. Root, Medina. "Apicultural Progress with Plans for 1914," Dr. Burton N. Gates, President National Beekeepers' Association and Prof. of Beekeeping in Massachusetts Agricultural College.

FRIDAY, 9:00 A. M.

Music. "Wax Rendering and Refining," D. H. Morris, Springfield. "Sac Brood," J. E. Venard, Wilmington. "Some Recent Findings in Brood-disease Suppression," Dr. Gates. "Producing a Crop of Extracted Honey," J. F. Moore, Tiffin.

FRIDAY, 1:00 P. M.

"A Hive Standard," Dr. Gates. "Short Cuts in Extracting Honey," H. H. Root. General discussion. Athens, O. W. A. MATHENY, Sec.

NATIONAL BEEKEEPERS' ASSOCIATION CONVENTION, ST. LOUIS, MO., FEBRUARY 17, 18, 19, 1914.

The annual convention of the National Beekeepers' Association will convene at the Planters Hotel, St. Louis, Feb. 17, 18, 19, 1914. The first session will be held Feb. 17 at 10 A. M. A large hall and office rooms have been provided at the hotel.

The following rates on the European plan have been granted to the beekeepers and their friends:

FOR ONE PERSON.

Rooms without bath, \$1.50 to \$2.00 per day; rooms with bath, \$2.50 to \$5.00 per day.

FOR TWO PERSONS.

Rooms without bath, \$2.50 to \$3.00 per day; rooms with bath, \$3.50 to \$7.00 per day. For each person over two in a room, \$1.00 additional.

The Planters Hotel is one of the finest in the city, and guests will be nicely taken care of.

It is hoped that this convention may prove one of our old-style gatherings, where we meet many of our old friends and make many new ones. All meetings will be open to all the beekeepers who will come, whether members of the Association or not.

What is needed is a large attendance. Let the beekeepers rally and make this a rousing gathering, such as we had in 1909, during the World's Fair. Bring your wife and daughters. St. Louis will try to make it pleasant for all.

There will be rooms in the hall for exhibits if any manufacturers or beekeepers wish to show, or adjoining rooms can be had if desired.

ROBERT A. HOLEKAMP,
President St. Louis Beekeepers' Club.
4263 Virginia Ave., St. Louis, Mo.

PRELIMINARY PROGRAM

The headquarters of the National Beekeepers' convention will be Planters Hotel, where the meetings will be held. Those wishing hotel reservations may request the Secretary, Mr. E. B. Tyrrell, 214 Hammond Bldg., Detroit, Mich., to assist them.

Some of the peculiar features of this convention may be outlined. Arrangements are pending for the use of the new moving-picture film relating to beekeeping. The showing of this film will possibly be in a moving-picture theater.

An attempt is being made to procure ample space for displays of manufacturers, dealers, and inventors of new appliances. Those intending to make displays should communicate with the secretary.

The meetings of the convention will be divided as found requisite, devoting time to the reading of the numerous important papers as well as to the transaction of business by the delegates.

It may be announced to the delegates, however, that a number of vital and important problems confront the Association for action. Every affiliated society should, if possible, be represented by a delegate. Otherwise send communications and instructions to the secretary.

The program as announced below is preliminary, and is subject to change. An effort has been made, however, to secure the very best talent available in the country and abroad. In the absence of authors of papers, the contributions may be read for the writers. Any suggestions or additions will be appreciated.

TUESDAY, FEBRUARY 17.

9:30, opening session. Seating of official delegates. Appointment of committees as well as routine business will be prosecuted in due form. "Suggestions for the Betterment of the National," Editor E. D. Townsend, Northstar, Mich.

1:00 P. M. Session for discussions. (Since the program is constantly growing, final arrangements are not yet possible. The papers offered are, therefore, grouped and listed below.)

7:00. Business session.

8:00. Lectures with the lantern.

WEDNESDAY.

9:00 A. M. Business session, with papers as time may permit.

1:30 P. M. Short business session.

2:00. Discussions and papers.

7:00 P. M. Business session.

8:00. Lectures.

THURSDAY.

9:00 A. M. Business session, followed by papers as may prove possible.

2:00 P. M. Closing session. Final adjournment is subject to the business program.

PROGRAM OF PAPERS AND CONTRIBUTIONS SUBJECT TO ARRANGEMENT.

Apicultural Education and Promotion.—"The Question of Apicultural Education," Prof. Morley Pettit, Guelph, Ontario, Canada. "Developing the Industry," Mr. Frank C. Pellett, Atlantic, Iowa. "Modern Business Methods Applied to Beekeeping," Mr. F. B. Cavanagh, Hebron, Ind. "Organization of the Beekeepers," Mr. Jenner E. Morse, Saginaw, Mich.

The Queen Business.—"Direct Introduction of Queens," Mr. J. M. Buchanan, Franklin, Tenn. "Selective Breeding," Mr. George B. Howe, Black River, N. Y.

Beekeeping by Localities.—"New Jersey Beekeeping," Prof. T. J. Headlee, New Brunswick, N. J. "Honey Resources of New Jersey," Mr. E. G. Carr, New Egypt, N. J. "California Beekeeping Up and Down to Date," Mr. J. D. Bixby, Covina, Cal. "Beekeeping in Southern California," Mr. Homer Mathewson, Binghamton, N. Y. "History of Beekeeping in California," Mr. J. E. Pleasants, Orange, Cal. "Development of Apiculture in Oregon," Prof. H. F. Wilson, Corvallis, Oregon. "Beekeeping in Europe," Mr. C. P. Dadant, Hamilton, Ill. "Making a Market for Five Hundred Cars of Western Honey," Mr. Wesley Foster, Boulder, Col.

Wintering.—"Building the Perfect Bee-cellar," Mr. E. S. Miller, Valparaiso, Ind. "Humidity in the Wintering of Bees," Dr. E. F. Phillips, Washington, D. C. Others to be announced.

Special and General Subjects.—"Restoring the Soil Fertility and Producing Honey," Dr. H. A. Surfact, Harrisburg, Pa. "The Secretion of Nectar," Dr. F. W. L. Shaden, Ottawa, Can. (Subject to be announced), Mr. J. J. Anderson, Salem, Ida.

"Moving Bees from the North to the South for Increase," Mr. E. R. Root, Medina, O. "Beekeeping as a Money-making Proposition," J. J. Wilder, Cordele, Ga. Subject to be announced, Prof. Wilmon Newell, College Station, Tex. "Automatic Recording Instrument," Prof. C. E. Sanborn, Stillwater, Okla.

Remember there are other papers to be presented, but which can not yet be announced.

All interested in bees, especially ladies, are cordially invited to attend the meetings. The sessions are open to the public. Business sessions, however, are participated in only by delegates.

Amherst, Mass. BURTON N. GATES, Chairman.

Kind Words from our Customers

THE MISSION WORK AMONG THE HIGHLANDERS OF KENTUCKY.

Among the many things I have to thank God for is the one of being in touch with the great and good men and women of the present age. Before I submit a "kind letter" from one of these I want to introduce him by an extract from a sermon by DeWitt Talmage entitled "Bloody Breathitt."

Many years ago a soldier in Morgan's Confederate army rode over the mountains of the South. There for the first time he came in touch with the misery and ignorance and the nobility of the mighty Highlanders. After the war was closed, this brave soldier of war entered a theological seminary and became a soldier of the cross. Called to one of the chief pulpits of Louisville, he felt that barrack duty was not the place of honor. He longed for the picket line. He wanted to fight at the front, as he did in Morgan's brigade. Called to be a synodical missionary, at once he accepted the appointment.

As the synodical missionary, his thoughts immediately turned to the place of the greatest want and wretchedness, to the Highlanders of the mountains. He organized church after church. He sent missionary after missionary into these hills. Then the synod met and began to count its money. Little money was there. Then the officers of that synod ordered this synodical missionary to retrench, and not to build so many churches and schools, as they could not afford to pay for them. Then a wonderful thing happened—wonderful because it was so simple in a man of great faith.

Doctor Edward O. Guerrant resigned as the synodical missionary. Before that synod he uttered these words: "Brethren, if you can not afford to pay for the schools and churches and the missionaries for the poor Highlanders, God can pay for them." Doctor Guerrant went back to his home in Wilmore, Kentucky. There he knelt and asked God for help. The money commenced to pour in. Church after church has been established. School after school has been built. Missionaries after missionaries have been gathered for these fields. The orphan children were gathered into a home. Though wonders have been accomplished by this man of prayer, yet only the outer edge of the harvest has been gathered.

My Dear Mr. Root:—My friend and neighbor, Mr. DeVault, takes your interesting magazine, and was kind enough to let me read your last number, and especially your article on the sorrowful condition of the poor people in New Jersey, etc. I am glad that such people have such a friend, and hope that God will raise up many more. I take pleasure in enclosing you some information of another class of our poor countrymen, who, though poor, are not degenerate, and still retain many of the noblest traits of their ancestors. Gen. O. O. Howard was my friend, and twice honored us by visiting our home in Kentucky, and traveled with me to many of our missions among the Highlanders. If I were at home in Kentucky I should be very glad to send you his graphic account of his tour among the Highlanders. I am spending a few months here, during our cold weather in Kentucky.

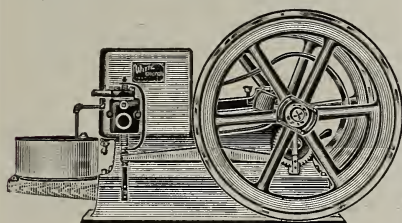
With assurances of my kindest regards and best wishes, and begging an humble place in your prayers, I am sincerely

Your brother and servant, EDW. O. GUERRANT.

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to earn its own
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DON'T break your back
or waste time doing
an engine's work. Iron
and steel are cheaper than
muscle; and kerosene oil,
cheaper than time. I fur-
nish the power of 10 men's work for 3½c
an hour; 30 men's work for less than 80c
a day, cost of engine included.



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Made in sizes 1½, 2, 4, 6, 8, 11, 12, 15, 20, 25, 30 and 40 H-P. Stationary. Portable. Skidded and Saw-rig Styles. Standard the world over for all shop and farm power uses. Over 27 years ago I made my first engine and gave it my name, and ever since I have kept the active building of every WITTE engine in my own hands. I know every engine I ship, inside and out, and am making lower engine prices than this country has ever seen, while delivering engines that can't be beat.

60 DAYS FREE TRIAL

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Why take chances on a poor, or an unknown engine for any price when the WITTE is so cheap; when it is sold on any easy reasonable payments; and under a stronger money-back guarantee than any manufacturer has ever yet dared to sign?

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Let me send you my Free Book, the finest in the whole engine business. Learn the cost of past high prices, and why I can undersell the whole field, and giving unmatched quality. Let me tell you by return mail how easily you can own a WITTE.

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1932 Oakland Avenue, Kansas City, Mo.

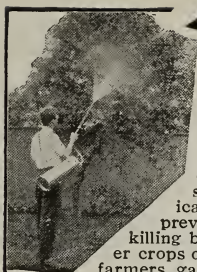
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most efficient—Style No. 1 shown here. Capacity 4 gallons. Easily carried over shoulder. Does more work than 3 ordinary sprayers. Patented Auto Pop Nozzle—throws any kind of spray—does not clog.

Better Vegetables, Bigger Crops



Just the size for small trees, fields up to 5 acres, poultry houses, etc. For large sprayers—Brown's

NON-CLOG ATOMIC NOZZLE

sprays any solution

without clogging.

Guaranteed. 40

styles, sizes—

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Spraying

Guide.

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Brown Co.

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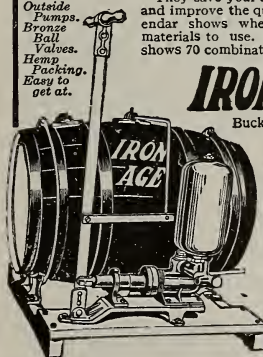
Rochester,

N. Y.



SPRAYERS Are a Necessity and a Benefit.

Outside
Pumps.
Bronze
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Easy to
get at.



They save your crop, increase the yield and improve the quality. Our Spray Calendar shows when to spray and what materials to use. Our "Spray" booklet shows 70 combinations of

IRON AGE

Bucket, Barrel, Power and Traction Sprayers for orchard and field crops and other uses. Built complete or in units—buy just what you need. Ask your dealer to show them and let Uncle Sam bring you the rest of the story and the spray calendar. Also "Iron Age Farm and Garden News" free.

Bateman Mfg. Co.
Box 1204
Grenloch, N. J.



WHITEWASHING

and disinfecting with the new
"Kant-Klog"
Sprayer

gives twice the results with same labor and fluid. Also for spraying trees, vines, vegetables, etc. Agents Wanted. Booklet free.
Rochester Spray Pump Co.,
207 Broadway, Rochester, N. Y.

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The astounding success of Gaso-Kero two-cycle kerosene engines is based upon the perfect Bessemer Universal Fuel Feeder, controlled exclusively by us.

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This perfect fuel feeder has sounded the death knell of carburetors, and is the only thoroughly successful device for feeding kerosene, gasoline, distillate, etc., without change of equipment. It is revolutionizing the engine business. It is the one big, right idea; we discovered it, and cranked it, you cannot get it in any but a "Gaso-Kero." "Gaso-Kero" two-cycle engines are simple—only three moving parts—are constant and steady as clocks. 2 to 350 H. P. Immediate shipment.

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BEST FOR ELECTRIC LIGHTING

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It runs on kerosene (coal oil), gasoline, alcohol or distillate without change of equipment—starts without cranking—runs in either direction—throttle governed—hopper cooled—speed controlled while running—no cams—no valves—no gears—no sprockets—only three moving parts—portable—light weight—great power—starts easily at 40 degrees below zero—complete, ready to run—children operate them—5-year ironclad guarantee—15-day money-back trial. Sizes 2 to 20 horsepower.

Send a postal today for free catalog, which shows how Sandow will be useful to you. Our special advertising proposition saves you one-half cost of first engine sold in your county. (164)

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14 CENTS A ROD

for 26-in. hog fence

23½ c. a rod for 49-in. farm fence

25½ c a rod for 60-in. poultry fence

\$1.40 for 80 rod spool of Ideal

Barbed Wire. Large free Catalog showing 100 styles of Farm, Poultry and Lawn Fence.

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FREE BARGAIN BOOK

Save 30 per cent buying direct from factory, freight prepaid. Over 150 styles for every purpose, all Double galvanized, 13c per rod up. New Bargain Catalog and Sample to test. **ALL FREE.** Mail postal NOW, to **THE BROWN FENCE & WIRE CO.** Dept. 91 Cleveland, Ohio



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Direct from factory, freight prepaid. Over 150 styles for every purpose, all Double galvanized, 13c per rod up. New Bargain Catalog and Sample to test. **ALL FREE.** Mail postal NOW, to **THE BROWN FENCE & WIRE CO.** Dept. 91 Cleveland, Ohio



FARM FENCE FROM FACTORY TO FARMER

Made of **OPEN HEARTH STEEL WIRE.** Proven by tests to be the most durable wire produced. Heavily Galvanized with **PURE ZINC.** Sixty different styles and heights, each a satisfying-quality fence.

WE SELL DIRECT TO THE FARMER AT DEALER'S PRICES.

Be your own merchant and put the Dealer's Profit in your own pocket where it belongs. The following are a few of our big values:

26-inch Hog Fence, - - 14c. per rod.
41-inch Farm Fence, - - 21c. per rod.
48-inch Poultry Fence, - 22½c. per rod.
Special Barbed Wire, \$1.40 per 80-rod Spool.

Sold on **30 DAYS FREE TRIAL.** Get in with the shrewd buyers by sending for our big free Catalogue. It's full of fence bargains. Write for it today.

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Helps his wife to plan her table in busy times. Saves work and worry, saves buying so much meat, gives better satisfaction to the help. A good garden will be almost impossible in your busy life without proper tools. They cost little and save much hard work.

IRON AGE WHEEL HOES AND DRILLS

will sow, cultivate, ridge, furrow, etc., better than you can with old-fashioned tools and ten times quicker. A woman, boy or girl can do it. Can plant closer and work these hand tools while the horses rest. 38 combinations from which to choose at \$2.50 to \$12. One combined tool will do all of the work.

Ask your dealer to show them and write us for booklet, "Gardening With Modern Tools," and "Iron Age Farm and Garden News" both free.



BATEMAN MFG CO.
Box 1202 Grenloch, N. J.

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You can raise large crops of delicious berries from a small piece of ground if you start right—with hardy, prolific, carefully grown plants selected from **ALLEN'S TRUE-TO-NAME VARIETIES**

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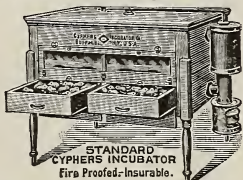
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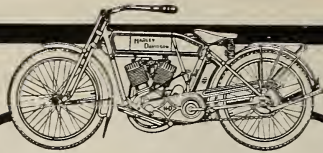
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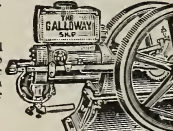
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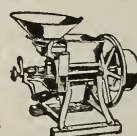


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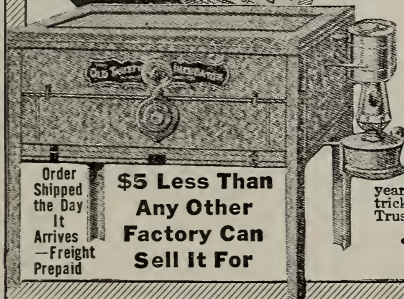
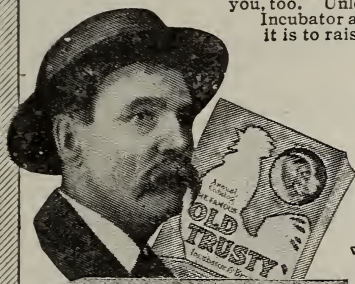


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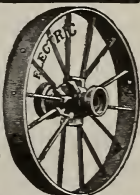
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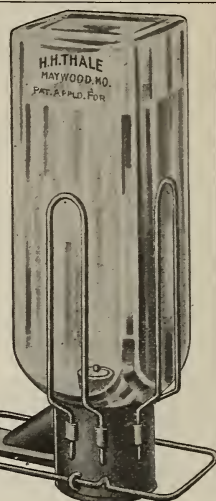


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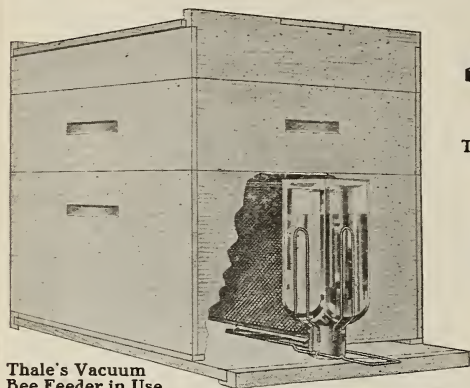
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MOST perfect stimulative feeder ever constructed. It feeds inside underneath the cluster, and will fit any hive made. To fill feeder, lift off empty bottle and set on full one. It is so regulated by the slide from the outside of the hive to feed any amount that you may want the bees to have in one day. If you set it on one-half pint in one day the bottle of feed will run four days and nights and can be increased or decreased from the outside of the hive without disturbing the bees or moving the feeder. It feeds continuously, thereby imitating a natural honey flow, and will produce more brood with less cost than any other feeder made, and can be filled any time of the day without causing robbing or excitement.

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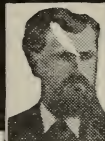
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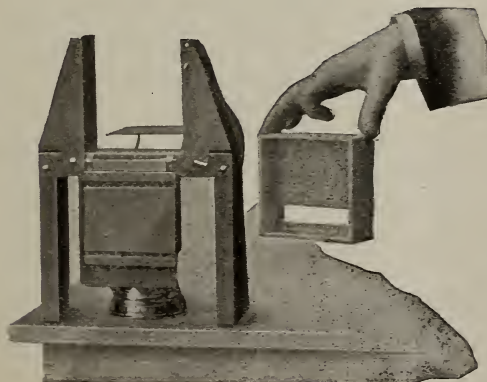


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See our special sale of honey on advertising page 11 of this issue. THE A. I. ROOT CO., Medina, O.

Bronzed honey labels, 1000 for 80 cts.; others, 60 cts. per 1000. PEARL CARD CO., Clintonville, Ct.

Advertise your business with Business Cards. 500 printed, 75c. PEARL CARD CO., Clintonville, Ct.

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FOR SALE.—White clover at 10 cts. per lb., and fall honey at 8 cts. per lb., put up in 60-lb. cans. Sample, 10 cts. WM. WERNER, Rt. 2, Chadwick, Ill.

FOR SALE.—Several tons of raspberry-milkweed honey (mostly milkweed) in new 60-lb. cans (two in case), a very fine honey. Write for price. Small sample free. P. W. SOWINSKI, Bellaire, Mich.

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WANTED.—Comb honey and beeswax. State what you have and price. J. E. HARRIS, Morristown, Tenn.

WANTED.—Honey, extracted and comb. Will buy or handle on commission. Beeswax—will pay highest price. HILDRETH & SEGELKEN, New York, N. Y.

We pay highest market price for beeswax. Will also work your beeswax into "Weed Process" foundation for you at reasonable price. SUPERIOR HONEY CO., Ogden, Utah, and Idaho Falls, Idaho.

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FOR SALE.—Better hive for less money. Beekeepers' supplies and standard-bred Italian bees. Write for catalog. A. E. BURDICK, Sunnyside, Wash.

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WANTED.—Southern queens. 200 for May delivery.
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WANTED.—100 or more cases of five-gallon second-hand cans within shipping distance of New York.
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WANTED.—To exchange "Root" bee supplies and "American" honey-cans for honey in five-gallon cans or for beeswax. SUPERIOR HONEY CO., Ogden, Utah, and Idaho Falls, Ida.

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Will exchange 500 back numbers of magazines, including 125 *Ladies' Home Journals*, for honey. Prof. Bailey's works on agriculture, or offers.
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Pure Italian bees or their hybrids, in L. 10 frames, wired, full foundation, 1 or 100.
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FOR SALE.—Golden Italian queens that produce golden bees; for gentleness and honey-gathering they are equal to any. Every queen guaranteed. Price \$1.00; 6 for \$5.00.
WM. S. BARNETT, Barnett's, Va.

Golden Italian queens that produce golden bees, the brightest kind, gentle, and as good honey-gatherers as can be found. Each: \$1.00; six, \$5.00; tested, \$2.00; breeders, \$5.00 to \$10.00.
J. B. BROCKWELL, Malvern Hill, Va.

Golden-yellow Italian queens my specialty. Untested, \$1.00; tested, \$1.50. Ready April 1. Safe arrival guaranteed. E. A. SIMMONS, Greenville, Ala.

Phelps' Golden combine the qualities you want. They are great honey-gatherers, beautiful and gentle. Mated, \$1.00; tested, \$2.00 and \$3.00; breeders, \$5.00 and \$10.00. C. W. PHELPS & SON,
3 Wilcox St., Binghamton, N. Y.

Pamphlet, "How I Raise My Queens," extra good for beginners; also price list and testimonials of my queens postpaid for 5 cts. in stamps to any address.
CURD WALKER, Queen-breeder,
Jellico, Rt. 1, Box 18, Tenn.

QUEENS.—I am wintering 350 choice tested three-banded Italian queens raised last September. Ready for delivery March 20 to April 10. Price \$1.50 each. Select, \$2.00. Untested, 1 queen, \$1.00; 10 queens, \$7.50. Order early. No poor-looking queens sent out. Send for circular. H. PERKINS, Artesia, Cal.

FOR SALE.—Several yards of bees on five years' time and easy terms of payment. No disease, and best of locations. All we ask is that you help us work these bees for several months this year to show your ability to manage them. Further particulars on request. SPENCER APIARIES CO., Nordhoff, Cal.

Dunn's Golden Italian queens, bred strictly for business, that produce a strong race of honey-gatherers. March 1 to Oct. 15: One, mated, 75 cts.; 6, \$4.25; 12, \$8.25; 50, \$32.50; 100, \$60.00. Tested, \$3.00; breeders, \$10.00. L. J. DUNN, Queen-breeder, Box 337 G, Rt. 6, San Jose, Cal.

Queens bred from Moore's and Doolittle's best Italian stock; untested, 60 cts. each; \$6.60 per doz.; \$50 per 100. Tested, 90 cts. each; \$10.20 per doz.; \$80.00 per 100. Delivery guaranteed. Book orders now. Nuclei, any quantity, two-frame, \$1.50; three-frame, \$2.00. Add price of above queens wanted. SPENCER APIARIES, Nordhoff, Cal.

FOR SALE.—Three-banded Italian queens, nuclei, and bees by the pound. March 15 to June 15, untested queens, each, 75 cts.; 6, \$4.25; 12, \$8.25; tested, each, \$1.25; 6, \$7.25; 12, \$14.00. Bees by pound: 1-lb. package, \$1.25; 6, \$7.25; 12, \$14.00. If you wish a queen with bees by the pound add price of queen. Write for circular and complete price list.
BROWN & BERRY, Hayneville, Ala.

FOR SALE.—California Italian queens, Golden and Three-banded by return mail after March 15; select untested, 75 cts.; 12, \$8.00; tested, \$1.00; breeders, \$3.00. Bees by the pound a specialty, ready April 1; 1 lb., \$1.35; 2 lbs., \$2.50; large lots, less. Booking orders now. Deliveries and satisfaction guaranteed. Correspondence solicited. Circular free.
J. E. WING, 155 Schiele Ave., San Jose, Cal.

GOOD QUEENS.—Good queens are a real necessity in any apiary if best results are to be expected. The old leather-colored three-band Italians have proven themselves to be the best general-purpose bees extant. These I can supply in any quantity you may wish. Untested, \$1.00 each; \$4.25 for six; \$8.00 per dozen. Safe arrival and satisfaction. All orders will have prompt attention.
E. J. ATCHLEY, Bloomington, Cal.

FOR SALE.—Early swarms at fall prices; ½-lb. bees, \$1.00; 1 lb. bees, \$1.50. Add price of queen if wanted. Untested three-band Italian queens, 75 cts. each; tested Italian queens, \$1.25 each. These are bred from best honey-gathering strain. No disease. Safe arrival and satisfaction guaranteed. This is undoubtedly the best way for Northern honey-producers to increase and improve their stock. Delivery begins about April 5. Capacity, 40 swarms per day.
W. D. ACHORD, Fitzpatrick, Ala.

FOR SALE.—Italian queens and bees by the pound. Ready for delivery by April 1, 1914. Having over 600 colonies of bees and 500 nuclei from which to draw, we expect to fill all orders very promptly. For a number of years we have been constantly improving our stock with commercial queen-rearing in view. Now we are in a position to guarantee satisfaction to our customers. Give us a trial order. Write for prices, etc. BROWN & BERRY, Hayneville, Ala.

FOR SALE.—Italian queens, bees by pound. Descriptive list free. Apiaries under State inspection. Leaflets, "How to Introduce Queens," 15 cts.; "How to Increase," 15 cts.; both 25 cts.

E. E. MOTT, Glenwood, Mich.

EARLY QUEENS.—Those who desire early queens can be supplied by sending orders to us. Only three-hand Italians stand the severe test against diseases, and our bees are clean. Untested queens, \$1.00 each; \$4.25 for six; \$8.00 per dozen. Always safe arrival and satisfaction to everybody. If you desire queens in large lots early, better let us book you as soon as convenient, and money can be sent when queens are wanted. Your check is good, or any way you wish to remit.

THE RIALTO HONEY CO., Box 73, Rialto, Cal.

Many men of many minds; but the minds of practical beekeepers are turned toward the old reliable three-band Italians. We have them in their purity, new blood, new importation. Untested queens from March to June, \$1.00 each; \$4.25 for six, or \$8.00 per dozen, safe arrival and satisfaction to all customers. Write for prices on large quantities. You do not have to return dead queens to us—just state it so on a postal card, and queens dead on arrival will be replaced promptly.

THE GOLDEN RULE BEE CO., Riverside, Cal.

POULTRY

Rhode Island Reds. Strong baby chicks for sale. Write me. E. O. WALTZ, Medina, Ohio.

FOR SALE.—Bourbon Red Turkeys, thoroughbreds. Prices right. MISS ARTIE DENNY, Owenton, Ky.

Eggs for hatching, S. C. White Orpingtons. Mating list free. JAMES R. LAMPSON, box B, Medina, O. class stock, \$10; \$12 per trio.

Silver Campines are money-makers. I offer first-ELMER W. PALMER, Catskill, N. Y.

LEGHORNS.—Eggs for hatching. S. C. W. Leghorn, \$5.00 per 100; \$1.00 per 15. Send for catalog. WOODWORTH FARM, Wilton, Ct.

Indian Runner breeding-ducks laying now. Utility and exhibition stock (pure white eggs) sent on approval. DERBY TAYLOR, Box G, Lyons, N. Y.

Eggs.—20 for \$1.00; leading varieties prize poultry, pigeons, hares, etc. Booklet free. Large illustrated catalog, 10 cts. F. G. WILE, Telford, Pa.

Rhode Island Reds, Partridge Wyandottes, Mottled Anconas, White Leghorns, White Cornish; Pekin, Rouen, Fawn, and White Indian Runner ducks; also pure-white Indian Runners and White Call ducks. Line-bred stock for sale. Eggs to set. Prices reasonable for high-class stock.

L. G. CARY, Trimble, Ohio.

PIGEONS

Pigeons! Pigeons! Thousands, all breeds; lowest prices; satisfied customers everywhere. Start with our \$\$\$-making Jumbo Squab-breeders. Large, free, instructive, illustrated matter.

PROVIDENCE SQUAB CO., Providence, R. I.

MISCELLANEOUS

Choice maple syrup direct from producer. C. C. PARKHURST, Rt. 1, Phalanx Station, Ohio.

Belgian hares, breeders, and youngsters. List free. HARVEY L. STUMB, Quakertown, Pa.

FOR SALE.—Whippoorwill peas, \$2.50 per bushel. W. T. LYONS, Decherd, Tenn.

HELP WANTED

WANTED.—Help in apiaries, 1914. Salary or shares. F. B. CAVANAGH, Hebron, Ind.

WANTED.—Reliable man to work with bees in outyards. State age, experience, and wages. A. L. COGGSHALL, Groton, N. Y.

WANTED.—Reliable man of good habits to work with bees and on small farm for season of 1914. Give age, experience, and wages.

FRANK KITLINGER, Caledonia, Wis.

WANTED.—A good young man for the season of 1914 to work with bees. State salary, experience, age, etc., in first letter.

FRANK C. ALEXANDER, Delanson, N. Y.

WANTED.—Young single man, familiar with bee business, to help with supplies, honey, and queen-production. We furnish board and lodging. State wages wanted. THE PENN CO., Penn, Miss.

WANTED.—Another young man of good habits, who is interested, to work with bees and on farm for coming season. Have nearly 1000 colonies.

N. L. STEVENS, Venice Center, N. Y.

WANTED.—Man (married preferred) experienced in queen-raising; employment by the year on a salary and percentage.

OGDEN BEE AND HONEY CO., Ogden, Utah.

WANTED.—A young man to learn the bee business by helping me during the summer months. State particulars in first letter. Tobacco or liquor users not wanted. HARRY W. BEAVER, Troy, Pa.

WANTED.—A permanent position for a farm-raised, reliable man, handy with tools, who has had some experience with bees, for my Wisconsin apiaries. Another man wanted for northern Louisiana.

H. C. AHLERS, Rt. 1, West Bend, Wis.

I could take two or three young men of good clean habits to learn beekeeping during the season of 1914; crop last year, 80,000 lbs. Board free, and something more if we both do well.

R. F. HOLTERMANN, Brantford, Ont., Canada.

WANTED.—Three good beemen for season of 1914, for work in Idaho and California. Must be strictly temperate, industrious, and willing to work hard in the busy season. State experience, age, and salary required, in first letter. N. M., care of GLEANINGS, Medina, Ohio.

BEEKEEPERS' DIRECTORY

If you need queens by return mail send to J. W. K. SHAW & Co., Loreauville, Iberia Parish, La.

Nutmeg Italian queens, leather color, after June 1, \$1.00. A. W. YATES, Hartford, Ct.

Well-bred bees and queens. Hives and supplies. J. H. M. COOK, 70 Cortlandt St., New York.

QUEENS.—Improved red-clover Italians, bred for business. June 1 to Nov. 15, untested queens, 75c. each; dozen, \$8.00; select, \$1.00 each; dozen, \$10; tested queens, \$1.25 each; dozen, \$12.00. Safe arrival and satisfaction guaranteed.

H. C. CLEMONS, Boyd, Ky.

Quirin's famous improved Italian queens, nuclei, colonies, and bees by the pound, ready in May. Our stock is northern-bred and hardy; five yards wintered on common stands in 1908 and 1909 without a single loss. For prices, send for circular.

QUIRIN-THE-QUEEN-BREEDER, Bellevue, Ohio.

SPECIAL NOTICES

BY OUR BUSINESS MANAGER.

BEEWAX IN DEMAND.

The market price of beeswax continues to grow stronger, as the several interests using it keep bidding against each other for the moderate supplies being offered. The price has reached a point much higher than we have ever known it to go before. We are obliged to withdraw all printed prices—retail, wholesale, and jobbing—on comb foundation from this date. We will quote such prices as we are able to make from time to time for immediate acceptance only.

SWEET-CLOVER SEED.

Since our last issue we have sold out our stock of unhulled white-sweet-clover seed, and greatly reduced our stock of other kinds. The demand is something remarkable for so early in the season, and prices are as high already as they were any time last spring. We have engaged a thousand pounds of unhulled white in Oregon, which we shall hardly have in stock for several weeks. In the mean time we will furnish seed, while our stock lasts, at as low a price as we are able to make. Our prices to-day which are not guaranteed, are as follows:

Prices in lots of	1 lb.	10 lb.	25 lb.	100 lb.
Melilotus alba, biennial:				
White sweet clover, unhulled..	23	\$2.10	\$5.00	\$19.00
White sweet clover, hulled..	30	2.80	6.75	26.00
Melilotus officinalis, biennial:				
Yellow sweet clover, unhulled..	21	1.90	4.50	17.00
Yellow sweet clover, hulled..	28	2.60	6.25	24.00
Yellow sweet clover, annual..	14	1.20	2.75	10.00

SPECIAL LOTS OF SWEET-CLOVER SEED.

We have available a few hundred pounds of unhulled sweet-clover seed, biennial, mixed white and yellow. As a soil renovator and producer of hay as well as honey this is fully as good as any. Unless you desire to save seed of a single variety this will be as good as any. Price, while it lasts, \$1.50 for 10 lbs.; \$3.50 for 25 lbs.; \$13.00 per 100 lbs.

We have also a few hundred pounds of hulled seed which is alfalfa and white sweet mixed. Sweet clover is often used to get alfalfa started by inoculating the soil. The sweet clover is biennial, and lasts only two years if you do not allow it to reseed, while alfalfa is a perennial, and continues to grow year after year from the same root after once being started. Price of this lot while it lasts, 20 cts. per lb.; \$1.80 for 10 lbs.; \$4.25 for 25 lbs.; \$16.00 per 100 lbs.

We have at Medina, at Chicago, and at Des Moines, Iowa, a supply of unhulled yellow which we can furnish, while it lasts, at prices given in table above.

SPECIAL NOTICES

A. I. Root

In A. I. Root's department for Feb. 15 will appear a full account of the St. Petersburg-Tampa "Air-Boat Line," the first flying-machine which makes trips on schedule time, carrying passengers.



Large Eggs

now and all winter, too, if you feed your hens The Humphrey Way—fresh bone prepared in a

HUMPHREY BONE CUTTER
with its Always-Open Hopper. If you have 10 hens or more, write for our offer and a copy of our profitable book, "The Golden Egg."
HUMPHREY, MINE ST. FACTORY, JOLIET, ILL.

This Washer Must Pay for Itself

A MAN tried to sell me a horse once. He said it was a fine horse, and had nothing the matter with it. I wanted a fine horse. But I didn't know any thing about horses much. And I didn't know the man very well either.

So I told him I wanted to try the horse for a month. He said "All right, but pay me first, and I'll give you back your money if the horse isn't all right."

Well, I didn't like that. I was afraid the horse wasn't "all right," and that I might have to whistle for my money if I once parted with it. So I didn't buy the horse although I wanted it badly. Now this set me thinking.

You see I make Washing Machines—the "1900 Gravity" Washer.

And I said to myself, lots of people may think about my Washing Machine as I thought about the horse, and about the man who owned it.

But I'd never know, because they wouldn't write and tell me. You see I sell my Washing Machines my mail. I have sold over half a million that way.

So, thought I, it is only fair enough to let people try my Washing Machines for a month, before they pay for them, just as I wanted to try the horse.

Now, I know what our "1900 Gravity" Washer will do. I know it will wash the clothes, without wearing or tearing them, in less than half the time they can be washed by hand or by any other machine.

I know it will wash a tubful of very dirty clothes in Six Minutes. I know no other machine ever invented can do that, without wearing out the clothes.

Our "1900 Gravity" Washer does the work so easily that a child can run it almost as well as a strong woman, and it doesn't wear the clothes, fray the edges, nor break buttons the way all other machines do.

It just drives soapy water clear through the fibers of the clothes like a force pump might.

So, said I to myself, I will do with my "1900 Gravity" Washer what I wanted the man to do with the horse. Only I won't wait for people to ask me. I'll offer first, and I'll make good the offer every time.

Let me send you a "1900 Gravity" Washer on a month's free trial. I'll pay the freight out of my own pocket, and if you don't want the machine after you've used it a month, I'll take it back and pay the freight too. Surely that is fair enough, isn't it?

Doesn't it prove that the "1900 Gravity" Washer must be all that I say it is?

And you can pay me out of what it saves for you. It will save its whole cost in a few months, in wear and tear on the clothes alone. And then it will save 50 cents to 75 cents a week over that in washwoman's wages. If you keep the machine after the month's trial, I'll let you pay for it out of what it saves you. If it saves you 60 cents a week, send me 50 cents a week till paid for. I'll take that cheerfully, and I'll wait for my money until the machine itself earns the balance.

Drop me a line to-day, and let me send you a book about the "1900 Gravity" Washer that washes clothes in six minutes.

Address me this way—H. L. Barker, 1127 Court Street, Binghamton, N. Y. If you live in Canada, address 1900 Washer Co., 355 Yonge St., Toronto, Ontario.



EARLY-ORDER CASH DISCOUNTS

Apply Here just as they
do at the Factory

As Southwestern distributors of **ROOT'S BEEKEEPERS' SUPPLIES**, we are very glad to make this first announcement of a special discount for early orders, accompanied by cash, to our beekeeping friends throughout this territory.

We give exactly the same discount that is granted by the manufacturers of these famous goods, and the prices in our special catalog are the same as their own. There is an extra saving for you in ordering from us—**FREIGHT**. Better give this your special attention before ordering from elsewhere.

THE CASH DISCOUNT ON EARLY ORDERS PLACED IN FEBRUARY IS 2 PER CENT.

This applies to every thing in the way of beekeepers' supplies except a few special articles. On large general orders we will allow the discount on some of the excepted articles, not exceeding ten to twenty per cent of the entire order.

REMEMBER WE MANUFACTURE THE FAMOUS WEED PROCESS COMB FOUNDATION.

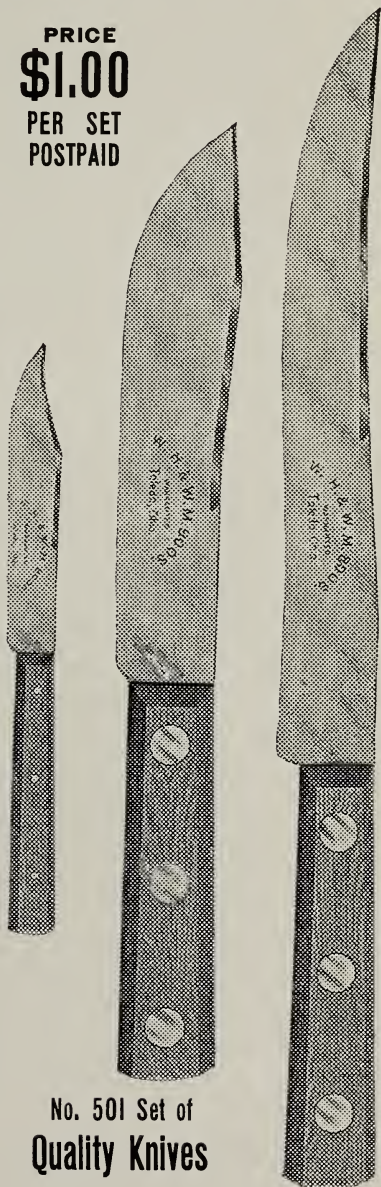
We have a large demand for this product, and are turning out comb foundation of the finest quality. Include what you will need for the opening of next season in your early order. Shipment may be held subject to your convenience if desired; but get your order in now and save 2 per cent.

Toepperwein & Mayfield Co.
San Antonio, Texas

No. 501 Set of Quality Knives

OUR set of "QUALITY" KNIVES is made up of one 8-inch SLICER, one 6-inch BUTCHER, and one 3½-inch PARING-KNIFE. A combination of three of the MOST USEFUL SIZES and DESIGNS that one can have in his home. In presenting this set of knives we want to impress upon the trade the fact that these knives are all their name implies, **QUALITY IN THE STRICTEST SENSE OF THE WORD.** There is nothing better in the way of cutlery to be had for **IT IS IMPOSSIBLE TO MAKE ANY THING BETTER.** The Set is **MADE UPON HONOR THROUGHOUT** to the MINUTEST DETAIL. **BLADES** are of the **VERY BEST TEMPERED CRUCIBLE STEEL, SWEDGED, ETCHED, and FINISHED** with the Highest Polish it is possible to put on metal. Handles are **GENUINE COCOBOLO, Beveled Edges, Through Tang** with **Three Large Brass Saw Rivets.** We **ABSOLUTELY GUARANTEE** the **QUALITY** of this set of knives to be **Strictly First Class in Every Way** and the **BEST VALUE EVER OFFERED.** **LIST PRICE** the set \$1.00 postpaid.

PRICE
\$1.00
PER SET
POSTPAID



Premium Offer

We will send this complete set of knives postpaid to any reader who sends us one new yearly subscriber to *Gleanings in Bee Culture* at \$1.00 per year, or the same for four new six-months-trial subscribers at 25c. each.

Canadian postage on subscription for one year, 30c extra. On each trial subscription, 15c extra.

A WORD OF PRAISE FOR THE PREMIUM KNIVES.

Calvert, Ala., Oct. 22, 1913.

The A. I. Root Co., Medina, Ohio.

I received the set of premium knives and am well pleased with them.

Yours very truly,

R. RHODENBERGER.

No. 501 Set of
Quality Knives

The A. I. Root Co., - Medina, Ohio.

Save \$300⁰⁰ to \$1,000⁰⁰ On Your New House!

Write for Grand **FREE BUILDING MATERIAL Catalog**

Bargains Shipped Anywhere

There is not a moment's time to lose if you want to put up a new house or repair an old one at lowest possible cost. Our Great New Catalog **beats any lumber yard in America** for bargain prices on High-Grade, Guaranteed Building Material. We are

Plan
No. 141



All Lumber, Hardware, Millwork and Paints **\$529**

Bargain Headquarters. To make sure of saving several hundred dollars on your new house, sign that coupon at the bottom of the ad and **rush it to us at Davenport!** Our Warehouses, Mills and Yards are filled with immense stocks of Sash and Doors, Lumber, Interior Finish, Wallboard, Roofing, Flooring, Paint, Builders' Hardware, Stair Work, Porch Work, Mouldings, etc., etc. Until further notice, everything in the Catalog goes at the low prices now in force. Write for the Building Material Catalog. Here are a few of the 5,000 Special Bargain Offers on Building Material in the free catalog. Goods may be ordered direct from this ad, under our Guarantee of Satisfaction or Money Back.

HOT-BED SASH

No. E-440

\$1.75

Glazed complete. Made of best cypress. Our Hot-Bed Sash is the best in America. All sizes at Bargain Prices.



DOORS as Low as

77c

All Styles and Sizes
Quality Guaranteed

Hundreds of special designs, glazed and unglazed. Oak, White and Yellow Pine, Cypress, Fir, Oak Veneer, Solid Yellow Pine and Front Doors. Complete stock in our

Grand Free Millwork Catalog



JAP-A-TOP ROOFING

Beautiful, durable. Surfaced with genuine slate. Two colors, Red and Grayish Green.

\$2.25 Per Roll of 108 Sq. Feet



Jap-a-Top SHINGLES

Price per Square of **\$4.75**
424 Shingles



PAINT "Quality" House Paint, per gallon can, \$1.22. In barrels, per gallon, \$1.10. All shades and colors.

Quality Barn Paint, per gallon, 75c.

LUMBER in Car Lots—Save \$100 to \$300

Our Lumber List offers millions of feet of clear, dry, clean, seasoned lumber at wholesale prices. Dimension, heavy Joists and Timbers, Siding, Ceiling, Finishing Lumber, Shingles, Laths, Boards, Posts and Battens, etc. **ESTIMATES FURNISHED FREE.** Send us your list.

Send the Coupon Now for Our Grand 5,000 BARGAIN Catalog!

The Gordon-Van Tine Catalog beats any Lumber Yard or Planing Mill. Order at once to insure getting these bargain prices. Whether you are going to build or repair, get this Catalog before placing your order anywhere, at any price. Three big banks vouch for our responsibility. We refer you to thousands of satisfied customers in every community throughout the United States.

Get Our FREE BOOK OF PLANS

Over 70 Splendid Designs for Houses and Bungalows

Complete Blue-Print Plans furnished free when you build from our materials. In ordering Book of Plans, enclose 10 cents to pay cost of postage and mailing. Be sure to send the coupon today.

GORDON-VAN TINE COMPANY

5434 Case Street

(277)

Davenport, Iowa

FREE COUPON 3 Books 3

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5434 Case St., Davenport, Ia.

Gentlemen:—Please send the books checked below.

Name.....

Address.....

Occupation.....

☐ Millwork ☐ Plan Book
☐ Roofing Circular ☐ Lumber

In sending for Plan Book, enclose 10 cents for postage and mailing. You will receive the books by return mail.